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OIL SHALE TRACT C-b

INTERIM MONITORING REPORT

(November 1976 Through August 1977)

Submitted to:

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U.S. Geological Survey
Grand Junction, Colorado

By:

C-b Shale Oil Venture

Ashland Colorado, Inc.

Occidental Oil Shale, Inc., Operator

October 14, 1977

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RADIAN REPORT -

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CORPORATION

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AIR MONITORING REPORT
FOR
C-b SHALE OIL PROJECT
JUNE 1977
Report No. 34

26 August 1977

Presented to:
C-b Shale Oil Project
United Bank Tower
Denver, Colorado 80202

Prepared by:
Radian Staff

II B-1753

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I. GENERAL DESCRIPTION OF AIR MONITORING PROGRAM

Radian Corporation, under contract to the C-b Oil Shale Project, is performing the data compilation and reporting of air quality and meteorological data at one monitoring site in Northwest Colorado. The site measures and records concentrations of particulates, sulfur dioxide, oxides of nitrogen, hydrogen sulfide, total hydrocarbons, methane, and carbon monoxide. A 200-foot meteorological tower provides wind direction, wind speed, temperature, and relative humidity data at four levels (8, 30, 100, and 200 feet). Other meteorological variables measured at the tower site are insolation, barometric pressure, and precipitation.

Figure I shows the configuration of the monitoring station. The station provides a sturdy and protective covering for the monitoring equipment.

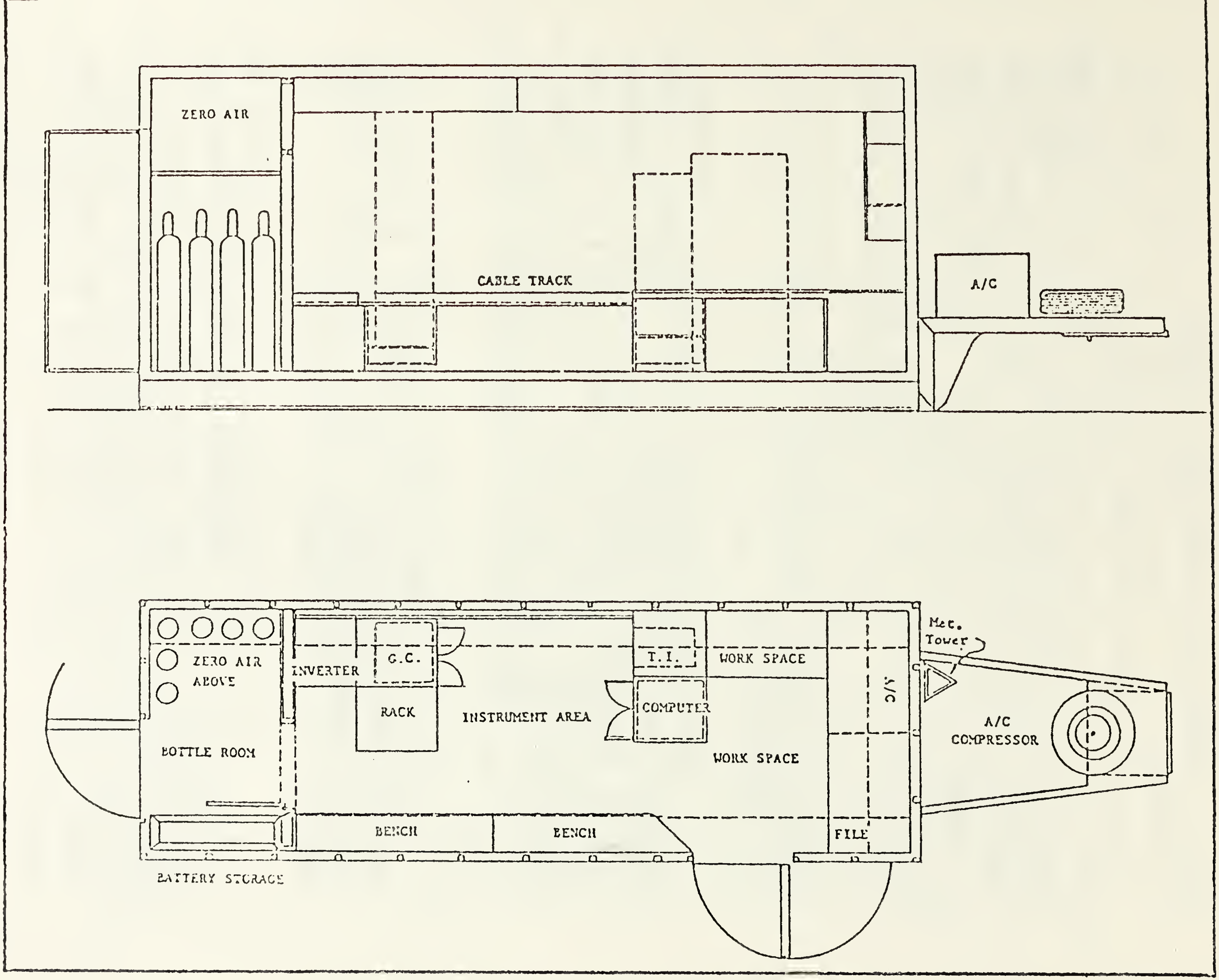
ZERO AIR
CABLE TRACK
A/C
ZERO AIR
ABOVE
BOTTLE ROOM
INVERTER
G.C.
RACK
INSTRUMENT AREA
T.I.
COMPUTER
WORK SPACE
WORK SPACE
A/C
Met.
Tower
A/C
COMPRESSOR
BENCH
BENCH
FILE
BATTERY STORAGE

FIGURE I. CONFIGURATION OF MONITORING STATION

II. DESCRIPTION OF INSTRUMENT SYSTEMS

A. Air Quality Instrumentation

Nitrogen oxides are measured with a Meloy Model NA520 analyzer. This dual-channel analyzer is based on the chemiluminescent principle and continuously monitors both NO_x and NO. A subtraction circuit in the instrument provides a continuous NO_2 output, but is not used in Radian's system. NO_2 is calculated once a second by the computer by subtracting the NO value from the NO_x value, thus avoiding any drift which might occur in the NO_2 output of the instrument. This instrument has a minimum detectable sensitivity of 5 ppb (parts per billion) and a linearity of ±1%.

Both sulfur dioxide and hydrogen sulfide are measured with Meloy Model SA185 sulfur analyzers. The hydrogen sulfide analyzer uses a Meloy Model NO_x-1 sulfur dioxide scrubber and the sulfur dioxide analyzer uses a Meloy Model H_2S-1 hydrogen sulfide scrubber. The Model SA185 is a continuous analyzer and utilizes the flame photometric principle of operation. The minimum detectable sensitivity is 5 ppb and the linearity is ±1%.

Ozone is measured with a Meloy Model OA350 analyzer. This instrument, based on the chemiluminescent principle, provides continuous measurement of ozone. The minimum detectable sensitivity is 0.5 ppb and the linearity is ±1%.

Total hydrocarbons, methane, and carbon monoxide are monitored with a Bendix Model 8200 gas chromatograph analyzer. This instrument, which uses a plume ionization detector, has a minimum detectable sensitivity of 5 ppb for all three components. The Model 8200 works on a five-minute cycle, i.e., one air sample is analyzed every five minutes, and the results are displayed for five minutes via a sample and hold circuit.

The air sample is drawn in through a glass cane and manifold supplied by the Ace Glass Company. The system has a 25mm diameter, through which a constant air flow is provided by an air pump rated at 60 cfm at 0" head pressure. The manifold has sampling ports to which 1/4" teflon lines to the instrument are connected. All joints in the sampling system are secured by O-ring compression fittings. The manifold is contained in a heated (100°F) chamber to prevent condensation of moisture. The teflon lines from the manifold to the instruments are insulated with 1/8" wall thickness rubber tubing.

The trailer has four heavy duty high volume particulate samplers (Hi-Vols). Fiberglass filter paper is used for the collection of particulate samples, after which each filter is brought to a controlled humidity before weighing. Each Hi-Vol has a flow recorded to permit correction for changes in air flow as the filter becomes loaded with particulates. Each Hi-Vol runs for a 24-hour period (midnight to midnight) and is turned on and off by the computer. The Hi-Vols, which were manufactured by Radian, were designed following guidelines recommended by the Environmental Protection Agency.

In addition to the normal Hi-Vol particulate samples, a duplicate Hi-Vol sample is collected every sixth day on special filter paper for trace element analysis. Once each quarter these samples are composited and analyzed for gross radioactivity and trace element content.

B. Calibration Procedures

The trailer contains a Meloy Model RAD-1 calibration unit. This instrument provides a zero air supply, SO_2 span gas from an SO_2 permeation tube, and NO span gas obtained by precisely diluting bottled NO span gas. The computer-controlled calibration of all instruments is automatically performed once a day. Each instrument is first switched to zero; the computer monitors the output of each channel and takes a new zero reading after a stable zero signal has been reached. This zero reading is compared by the computer to the zero reading obtained 24 hours before, and if a drift in excess of 10 ppb has occurred, an excess zero drift light for the channel in question is turned on on the System Status Panel. Next, span gas is supplied to each channel and the computer decides when a stable span value has been reached. This value is recorded and compared to the previous day's value. An excess span drift light on the System Status Panel is turned on if a drift exceeding 10 ppb occurs. The instruments are then returned to the monitor mode and after two minutes the computer resumes data taking.

The bottled NO gas used at each site was obtained from Precision Gas Products. Pre-purified grade hydrogen is used in the SO_2 analyzers.

The SO_2 permeation tubes were manufactured by Metronics Association, Inc. Their output has been verified by comparison to the output of National Bureau of Standards tube 10-42. Both SA185 analyzers in each trailer are calibrated with the SO_2 from the permeation tube. This instrument responds to the number of sulfur atoms per molecule; thus, SO_2 can be used to calibrate both the H_2S and SO_2 monitors.

The Model OA350 ozone analyzer has its own calibration system which provides a zero check and a span check. The ozone calibration system is verified by comparison to a calibrated ozone generator maintained in Radian's laboratory in Rifle.

The Model 8200 total hydrocarbon, methane, and carbon monoxide analyzer is calibrated with undiluted span gas obtained from AirCo's Rare and Specialty Gas Division. This span gas contains methane and carbon monoxide in air, the methane being used to calibrate both the total hydrocarbon channel and the methane channel. The Model 8200 is zeroes with air from a Bendix Model 8834 zero air unit. In addition, the instrument is electronically re-zeroed at the start of every five-minute cycle.

The Hi-Vol particulate samplers were calibrated using a Calibration Kit from General Metal Works.

C. Data Acquisition System

The basis of the data acquisition system is a Data General NOVA 1200 minicomputer. The NOVA, which has a basic cycle time of 1.2 μsec, is equipped with automatic program load and power fail/automatic restart features. The computer utilizes 16K 16-bit words of core memory. Analog-to-digital conversion is accomplished via an ADC built by Radian Corporation. The input/output unit for the system is Texas Instrument's KSR 733 keyboard/printer. This model teletype provides keyboard entry and hardcopy printed output. The data are also recorded on a cassette magnetic tape unit with three drives. The cassette unit is utilized for program storage and loading as well as for recording. To reduce wear on mechanical parts, the power to the teletype and cassette units is turned on only when the unit(s) is (are) to be used. Several important functions in the instruments as well as in the computer and the trailer are monitored by means of lights on a System Status Panel. These data lights are written onto cassette tape to monitor the complete status of the system every five minutes. The Data Acquisition System also monitors the presence of 100V power from the power lines. In its absence, the computer, which is powered by batteries, switches all trailer systems to battery-provided power. If the line voltage is restored before the batteries are discharged to a specified level, the trailer system is switched back to line power.

D. Meteorological Instrumentation

200-Foot Meteorological Tower

The tower has instrumentation at four levels: 8 feet, 30 feet, 100 feet, and 200 feet. At all four levels, there are: wind speed, wind direction, and temperature and relative humidity sensors in a power-aspirated radiation shield. Temperature difference thermistors (also in power-aspirated radiation shields) and their associated circuitry take lapse rate measurements for the 30-foot to 100-foot layer and the 30-foot to 200-foot layer. In addition, this site has a Precision Spectral Pyranometer, a barometer, and a tipping bucket rain/snow gage.

The wind direction and speed apparatus used at each measurement level of the tower is the Model 1074-2 wind sensor by Meteorological Research, Inc. (MRI). This sensor has a 540° potentiometer for wind direction and a light chopper for wind speed. This sensor is rugged, with an all-weather coaxial cup and damped vane assembly. The prototype model has been in operation for years under the most demanding weather conditions, performing continuously with the utmost reliability. The wind sensors on the tower have been specially treated with a black paint which will promote warming of the exposed surfaces of the sensor and thereby reduce ice and snow accumulations on the moving parts of the apparatus. The specifications on the Model 1074-2 are as follows:

Wind Speed

- Starting Threshold: 0.75 mph.
- Response Distance: 18 feet (63% recovery).
- Flow Coefficient: 7.9 feet/Revolution.
- Accuracy: ±0.4 mph or 1% (whichever is greatest)

Wind Direction

- Starting Threshold: 0.75 mph.
- Delay Distance: 4 feet (50% recovery).
- Damping Ratio: 0.5 to 0.6.
- Accuracy (540° system): ±1%.
- Range: 0° to 540°.

The relative humidity and temperature sensors are mounted within a power-aspirated radiation shield at each tower level. All aspirators and sensors are of the Model 840 Series by MRI. The aspirated shielded housing is designed to provide maximum radiation protection to the sensor. Ambient air is drawn into the shield and across the sensors at approximately 15 feet per second. This intake air is essentially sampled from a hemispherical space which is approximately 3-inch radius from the tube opening. Speed of the incoming air at the perhiphery of this hemisphere is approximately 1 mph.

The temperature sensor is comprised of a dual thermistor and resistor network. This circuit provides a linear resistance change with an air temperature change. The relative humidity sensor is placed alongside the temperature elements inside the shield where it is exposed to a constant flow of air. Circulation to both sides of the sensing element produces accurate monitoring with a good response time. The specifications on the sensing elements are as follows:

Temperature

- Accuracy: ±0.25° C.
- Range: -50°C to +50° C.

Humidity

- Accuracy: ±3.0% RH.
- Range: 0% to 100% Relative Humidity.

Measurements of temperature difference are taken for two layers, the 30-foot to 100-foot and the 30-foot to 200-foot layer. The thermistors and circuitry used for these measurements are separate from the thermistors measuring air temperature. The use of separate thermistors and circuitry to measure ΔT allows for much greater accuracy and resolution in the measurements, which is necessary for stability assessments. Two ΔT thermistors are at the 30-foot level, one is at the 100-foot level, and one is at the 200-foot level. All of these ΔT thermistors are mounted within power-aspirated radiation shields. The specifications on the ΔT instrumentation are as follows:

- Accuracy: ±0.1°C.
- Range of ΔT Circuit (Lower Level-Upper Level): +9F° to -9F°.

All instrumentation, except at the ground level, is mounted at the end of 12-foot retractable booms. These booms are 3-inch box beams which are on rollers and can be retracted to the instrument platforms for instrument maintenance.

The meteorological tower itself is a 200-foot Rohn Model 80 Guyed Tower, designed for 40 pounds per square foot wind load with ½" of radial ice per EIA Standard RS-222-B, to support four levels of meteorological equipment. The material consists of tower sections with a tapered base, three retractable booms 12-feet long, three outside work platforms, an inside ladder for climbing, two base ground kits and one anchor ground kit. The cable-type Safety Climbing Device consists of a cable and attachment mechanisms with a locking sleeve and safety belt. The tower is lighted and painted according to FAA specifications.

The signals from the tower instrumentation are fed from multiple signal cables into transmitters mounted at the base of the tower. After signals have been converted to analog signals, they are fed into a junction box, also at the tower base, where they are assimilated into one coaxial cable. The signals are then run underground within 3" PVC conduit to the A-to-D assembly, where they are processed. The transmitters are shielded and insulated from the elements. The signal cable is run underground in PVC conduit in order to minimize damage from the weather or from various rodents in the region.

The auxiliary equipment at the tower site consists of a heated tipping bucket rain/snow gage, an analog barometer, and a Precision Spectral Pyranometer. The rain/snow gage is the Model P511-E unit by Weather Measure. In the case of this gage, the durability and reliability of a tipping bucket gage are combined with heavy-duty electric heaters to make this an all-purpose precipitation sensor. This gage may be used to measure both snowfall and rainfall. An insulating cover of poly-vinyl chloride and a thermostatic control insure the proper gage temperature. The thermostatic control is adjustable from 0 to 35°C. Snow falling into the inlet funnel is melted. The resulting water (from rain or snow) drains into a precision tipping bucket mechanism which activates a mercury switch each time the bucket fills and tips. The gage is constructed of durable corrosion-resistant materials to provide many years of service. The specifications for this gage are as follows:

- Orifice: 8 inches.
- Calibration: 0.01 inch.
- Accuracy: 0.5% (Calibrated at 0.5 in/hr).
- Sensor: Chrome-plated tipping buckets.
- Switch: Mercury, 0.1-second closure.
- Heat Control: Thermostat adjustment, 0 to 35°C.

The barometer is the B242 Analog Output Barometer by Weather Measure. This barometer provides an output voltage that is linearly proportional to pressure. The specifications on this instrument, which is mounted inside the monitoring trailer at the site, are as follows:

- Range: Specially designed for the 100 millibar interval from 725 millibars to 825 millibars.
- Resolution: Infinite.
- Linearity: ±0.5 millibar, over the 100 millibar interval.

The pyranometer at the site is the Eppley Precision Spectral Pyranometer. This instrument is used for the measurement of sun and sky radiation totally or in defined wavelength bands. The pyranometer is levelled and mounted atop a wooden stand 4½ feet from the ground surface. Care has been taken to eliminate the effects from all outside influences, such as reflection or shadows, on the pyranometer. The instrument characteristics are as follows:

- Sensitivity: 5 mv. per cal/cm°/min.
- Independence: 300 ohms.
- Temperature dependence: Sensitivity constant to within ±1 percent over the ambient temperature range from -20 to +40°C.

- Linearity: Response linear up to intensities of 4 $cal/cm^2/min$.
- Response time: 1 second (i/e signal).

All instrumentation is factory-calibrated and is field-calibrated at various intervals. Sling psychrometers are used to calibrate the humidity sensors; known temperatures and/or resistances are used to calibrate the thermistors; and an rpm calibrating unit is used to calibrate the anemometers. The wind direction instrumentation is aligned to true north (reference direction) by means of a surveyor's transit.

III. MICROMETEOROLOGICAL AND TERRAIN FEATURES

The Piceance Creek Valley and C-b Shale Oil Tract are situated such that many microscale meteorological phenomena affect the region where the ambient air monitoring unit is located. Trailer 023 and its associated 200-foot meteorological tower are located atop a plateau to the south of the valley, high enough to be affected mostly by gradient flow conditions.

The elevation at the meteorological tower site (Trailer 023) is 6940 feet above sea level. The largest gradients in elevation in this area, of course, occur at the Piceance Creek Valley walls. However, the northern valley walls are slightly steeper than those at the southern boundary of the valley, which then slopes upward gradually toward the C-b Tract. The Piceance Creek Valley decreases in elevation from east to west in this area, so that nighttime katabatic cold-air drainage flows advect from east to west.

Site 023 is approximately 2.5 miles south of the Piceance Creek Valley. This location is relatively high compared to its surroundings, with the nearest point having an elevation greater than 7000 feet being .5 miles to the south of the tower. The tower itself is on the top of a small knoll located between Scandard and Sorghum Gulches. Because of its location and the irregularities of the surrounding terrain, meteorological patterns are varied here.

Wind instrumentation is mounted at four levels of the meteorological tower: 8 feet, 30 feet, 100 feet, and 200 feet. The top level of the tower generally remains in gradient wind flow. That is, the winds at that level are normally generated by synoptic-scale features and are usually separated from terrain features and micrometeorological circulations. Occasionally, a weak anabatic flow influence is experienced. However, such is not the case with the three lowest measurement levels. To varying degrees, these levels are influenced by both the katabatic and anabatic circulation cells. However, when strong pressure gradient forces exist in the region and the synoptic-scale wind flow is strong, all four tower levels will reflect a gradient wind flow as the winds increase in strength and height.

The terrain atop the plateau is generally barren and fairly rugged, with a few scattered small trees. The topsoil dries rapidly and is very fine, resulting in blowing dust when dry, windy conditions exist. In the Piceance Creek Valley, the terrain is fairly grassy and flat, with steep valley walls on either side. Surface winds are normally rather light in this valley unless channeling effects occur.

During clear nights with rather light pressure gradient-induced winds, rapid radiational cooling will occur in the region because of the barren nature of the terrain and the generally dry character of the air in this portion of the country. As a result, the diurnal range of temperatures will be extremely large. Because of the katabatic flow in the valley, nighttime temperatures will generally be lower in the valley than on the plateau. During the winter, especially, temperatures in the valley may be 20F° lower than they are on the plateau during the early morning hours.

IV. OPERATING TIME ANALYSIS FOR EACH SITE

This section presents the operating statistics for each of the major subsystems contained in the monitoring station. Table I shows the specific number of hours that each of these subsystems were inoperative for the month. The column labeled "DIGITIZING SYSTEM" indicates the entire data acquisition system; therefore, downtime hours appearing in this column means total loss of data. These instances include, in addition to computer downtime, power failures, no power available, and self-automated shutdown periods such as during air conditioner malfunctions.

Calibration time is not considered to be downtime and is, therefore, not included in the downtime figures. The amount of time used in calibrating the instruments is given at the bottom of the downtime analysis table and is reported as total calibration hours for each channel for the entire month. As is evident in the calibration figures, channels can be calibrated independently of one another. No calibration time is given for particulate monitoring since Hi-Vol calibration occurs infrequently and only during the off-duty cycle for each Hi-Vol while another Hi-Vol is taking data.

TABLE I.

DOWNTIME HOURS FOR C-b SHALE OIL PROJECT

SITE 023

DIGITIZED

DATE	SYSTEM	NOX	NO	SO2	S	WD	RH	TDPT	PYR	S'Z	VOLT	THC	CH4	CO	O3	PRES	RAIN	PART
6/ 1	0.	14.	0.	0.	0.	0.	24.	24.	4.	0.	0.	4.	14.	15.	0.	0.	0.	0.
6/ 2	1.	12.	0.	0.	0.	0.	24.	24.	0.	0.	0.	2.	14.	12.	0.	0.	0.	0.
6/ 3	1.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 4	1.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 5	1.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 6	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 7	1.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 8	0.	0.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/ 9	1.	0.	0.	0.	0.	0.	24.	11.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
6/10	0.	0.	0.	0.	0.	0.	24.	0.	0.	15.	0.	0.	0.	14.	0.	0.	0.	0.
6/11	1.	0.	0.	0.	0.	0.	24.	0.	0.	3.	0.	0.	0.	23.	0.	0.	0.	0.
6/12	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.
6/13	1.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.
6/14	1.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.
6/15	0.	14.	14.	0.	0.	0.	24.	0.	0.	0.	0.	2.	2.	10.	0.	0.	0.	24.
6/16	0.	24.	24.	21.	0.	0.	24.	0.	0.	24.	0.	23.	0.	0.	0.	0.	0.	0.
6/17	0.	24.	24.	0.	0.	0.	24.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.
6/18	0.	24.	24.	0.	0.	0.	24.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.
6/19	0.	24.	24.	0.	0.	0.	24.	0.	0.	0.	0.	23.	0.	5.	0.	0.	0.	0.
6/20	1.	25.	25.	0.	0.	0.	24.	0.	0.	0.	0.	10.	0.	1.	0.	0.	0.	0.
6/21	0.	24.	24.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6/22	1.	23.	22.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	7.	0.	0.	0.	0.
6/23	[illegible]	24.	24.	0.	0.	0.	24.	0.	0.	0.	0.	7.	7.	8.	0.	0.	0.	0.
6/24	1.	16.	16.	0.	0.	0.	24.	0.	0.	0.	0.	18.	18.	4.	0.	0.	0.	0.
6/25	1.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	24.	24.	0.	0.	0.	0.	0.
6/26	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	24.	24.	24.	0.	0.	0.	0.
6/27	1.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	19.	16.	0.	0.	0.	0.	0.
6/28	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	10.	10.	3.	0.	0.	0.	0.
6/29	0.	0.	0.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6/30	0.	16.	16.	0.	0.	0.	24.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	24.
CAL. TIME		14.	14.	13.	0.	0.	0.	0.	0.	13.	0.	25.	25.	25.	12.	0.	0.	

TABLE 1.
DOWNTIME HOURS FOR C-B SHALE OIL PROJECT

SITE 023

DATE	[illegible] SYSTEM	WS1	WD1	RH1	TMP1	WS2	WD2	RH2	TMP2	WS3	WD3	RH3	TMP3	WS4	WD4	RH4	TMP4	DT1	DT2
6/ 1	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 2	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 3	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 4	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 5	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 6	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 7	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 8	0.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	0.	0.	24.	24.	24.	24.
6/ 9	0.	0.	0.	24.	11.	0.	0.	24.	11.	0.	0.	24.	11.	0.	0.	24.	24.	24.	24.
6/10	1.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/11	1.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/12	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/13	1.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/14	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/15	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/16	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/17	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/18	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/19	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/20	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/21	1.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/22	1.	0.	0.	23.	0.	0.	0.	23.	0.	0.	0.	23.	0.	0.	0.	23.	23.	23.	23.
6/23	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/24	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/25	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/26	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/27	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/28	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/29	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
6/30	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	0.	0.	0.	24.	24.	24.	24.
CAL TIME		0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TABLE I.
DOWNTIME HOURS FOR C-B SHALE OIL PROJECT

SITE C2S

DATE	WWS1	HWD1	VWD1	WWS2	HWD2	VWD2	WWS3	HWD3	VWD3	WSD1	WSD2	WSD3	WSD4	HSD1	VSD1	HSD2	VSD2	HSD3	VSD3
6/ 1	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 2	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 3	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 4	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 5	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 6	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	0.	24.	24.	24.	24.	0.	0.
6/ 7	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	1.	0.
6/ 8	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	1.	0.
6/ 9	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/10	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/11	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/12	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/13	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/14	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/15	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/16	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/17	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/18	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/19	24.	24.	24.	24.	24.	24.	24.	24.	1.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/20	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/21	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/22	23.	23.	23.	23.	23.	23.	23.	23.	0.	0.	0.	0.	0.	23.	23.	23.	23.	23.	0.
6/23	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/24	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/25	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/26	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/27	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/28	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	1.	0.	0.	24.	24.	24.	24.	24.	0.
6/29	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
6/30	24.	24.	24.	24.	24.	24.	24.	24.	0.	0.	0.	0.	0.	24.	24.	24.	24.	24.	0.
CAL TIME	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

V. MONTHLY METEOROLOGICAL SUMMARY

A. Summary of the Meteorological Conditions Over North America During June 1977

Temperatures were above normal for all but the northeastern corner of the United States during June 1977. The northeastern corner of the U.S. experienced below normal temperatures during the month. Monthly precipitation totals were variable, but were generally below normal over all of the country. The cooler temperatures in the Northeast and the warmer temperatures elsewhere resulted from a mean upper-level long-wave trough over the Northeast and a mean upper-level long wave ridge over the West. The Southeast experienced warmer-than-normal temperatures as the long-wave trough was oriented too far to the north on most occasions to provide cold-frontal surface support to the Southeast.

The upper-level long-wave circulation was zonal (west-east) from the 3rd through the 5th, from the 12th through the 17th, and from the 22nd through the 30th. Split flow occurred on the 10th and 11th. Meridional flow (north-south) occurred on the 1st and 2nd, from the 6th through the 9th, and from the 18th through the 21st.

Extratropical low pressure systems were frequent in the northern United States during June. These low pressure systems developed in the northern states as warm and cold air interacted mostly in that region. The dates and locations of these low pressure systems were as follows:

1st: Rockies, Great Lakes
2nd: Rockies, New England
3rd: Great Plains
4th: Great Plains, New England, Pacific Northwest

5th: Great Plains, New England, Great Lakes
6th: Atlantic Seaboard, Great Lakes
7th: New England
8th: New England, Great Lakes, Great Plains
9th: Atlantic Seaboard, Great Lakes
10th: Atlantic Seaboard, Great Plains, New England
11th: Great Lakes, Great Plains, New England
12th: Great Lakes, Great Plains, New England, Atlantic Seaboard
14th: Southeast
15th: Atlantic Seaboard, Great Plains
16th: Great Plains
17th: New England
18th: Great Lakes
19th: New England
20th: Pacific Northwest
21st: Pacific Northwest, New England
24th: Atlantic Seaboard
25th: Atlantic Seaboard, Great Lakes, New England
26th: Great Plains, New England
27th: Great Plains
28th: Great Plains, Great Lakes
29th: New England
30th: Great Plains, Great Lakes

On a sectional basis, the following temperature and precipitation anomalies occurred during June:

Section	Temperature	Precipitation
Northeast	Slightly below normal	Slightly below normal
Atlantic Seaboard	Below normal	Variable
North Central	Near normal	Slightly below normal
Central	Slightly above normal	Variable; mostly above normal
Southeast	Slightly above normal	Variable; mostly below normal
Southwest	Slightly above normal	Slightly below normal
Rockies	Much above normal	Much below normal
West and Pacific Northwest	Above normal	Variable; mostly below normal

B. Summary of the Meteorological Conditions in Northwestern and West Central Colorado during June 1977

Grand Junction, Colorado, sixty miles to the south-southwest of the Tract C-b, received a total of 0.04 inch of precipitation during June, which is 0.51 inch below the monthly normal of 0.55 inch. Measurable precipitation occurred on the 9th. The region received 87 percent of the possible monthly sunshine. Sky cover by cloudiness averaged 4.0 out of a possible 10 during the daylight hours and 4.0 out of a possible 10 during the entire month. The region had twelve clear days, fourteen partly cloudy days, and four cloudy days during the month.

Air mass changes were infrequent during June. Only three frontal passages occurred during the month as the westerlies weakened and moved northward. Transport winds over the region were weaker in June than during May. Maritime polar cold frontal passages occurred on the 2nd, 6th, and the 24th.

C. Summary of the Meteorological Conditions in the Oil Shale Tract C-b Region during June 1977

Upper-level ridging during the first half of June combined with the northward movement of the westerlies during the second half of June caused a decrease in frequency of cold frontal passages during June compared to the month of May. Precipitation fell only on the 9th. Temperatures in the Tract C-b region were much above normal during June, while precipitation totals were much below normal.

Three cold frontal passages occurred during June. Maritime polar cold frontal passages occurred on the 2nd, 6th, and the 24th.

Temperature data was obtained for the period from June 10th through the 30th. The monthly average temperatures recorded at the meteorological tower during June were 66.6°F at 8 feet, 67.6°F at 30 feet, and 67.1°F at 100 feet. The 200-foot level temperature was down for the entire month. These averages are approximately 19F° higher than those recorded in May. The warmest days of the month were the 17th and the 26th through the 30th. The coolest days were the 10th, 11th, 12th, 21st, and 22nd. The highest temperature recorded at the meteorological tower during June was 87°F at the 8-foot level on the 29th. The coldest temperature recorded at the meteorological tower was 43°F at the 8-foot level on the morning of the 22nd.

The relative humidity sensors were down throughout the month of June.

Wind speeds on the meteorological tower during June were not as strong on the average as the winds that prevailed during

May. Resultant wind vectors at the meteorological tower during June were as follows: 221.7 degrees at 2.9 miles per hour at 8 feet; 213.1 degrees at 4.0 miles per hour at 30 feet; 211.6 degrees at 4.6 miles per hour at 100 feet; and 222.6 degrees at 5.4 miles per hour at 200 feet.

The scalar average wind speeds associated with these resultant wind vectors were 6, 8, 9, and 10 miles per hour, respectively. The Ekman spiral and Ekman effect, i.e., a veering in direction and increase in speed as a function of increasing height above the surface, were in evidence during most of June. A reference to the June wind rose for the meteorological tower indicates that the winds at that location were primarily south-southwesterly.

The windiest days of the month at the meteorological tower were the 9th, 14th, 18th, and the 20th. The days having the lightest winds were the 1st, 7th, 21st, 22nd, 23rd, and the 30th. The highest five-minute average wind speed recorded at the tower during June was 36 miles per hour at the 200-foot level on the 26th.

Precipitation totals in the Tract C-b Monitoring Network during June were generally below normal. Only 0.16 inch of precipitation was recorded at the meteorological tower during June. The largest daily precipitation total recorded in the network during June was 0.16 inch on June 9th. The greatest five-minute precipitation total recorded during the month was 0.10 inch (a precipitation rate of 1.20 inches/hour), recorded on the 9th. Measurable precipitation ($\geq$.01 inch) was recorded at the meteorological tower only on the 9th.

The monthly average station pressure during June was 791.3 millibars at the meteorological tower. This reading is

5.2 millibars higher than the May average station pressure of 786.1 millibars. The highest daily average station pressure occurred on the 4th, 5th, and the 6th. The lowest daily average station pressures occurred on the 8th, 9th, and the 20th.

Cloudiness decreased in the Tract C-b region during June, compared to the May cloud cover and insolation statistics. The region received an insolation total of 18,575.9 langleys, which is equivalent to a daily average insolation total of 619 langleys/day. This average is below the normal for June of 675 langleys/day in the Tract C-b region. On a diurnal basis, the greatest solar radiation rates occurred between 1200 and 1300 hours. The greatest daily radiation totals were received on the 12th, 14th, 15th, and the 17th through the 19th. The lowest daily solar radiation totals were received on the 1st, 6th, 7th, and the 8th. The greatest five-minute radiation total received during June was 8.55 langleys (a rate of 1.71 langleys/minute), which occurred on the 20th. The largest hourly insolation total received during June was 89 langleys, which occurred on the 3rd and the 20th between 1100 and 1200 hours.

Because of the progressively increasing solar elevations and the increasingly longer periods of daylight that prevailed during the first 21 days of June, the total possible solar radiation which could be received during a day increased monotonically throughout that period. During the remainder of June, the total possible solar radiation which could be received during a day decreased monotonically.

The decrease in cloudiness which affected the Tract C-b during June caused the "very unstable" stability classes to become more common than they had been in May. Using the Pasquill method of stability determination, "D" stability (neutral stability) was the most common stability, occurring during 208 daytime hours, or 47.6 percent of the time. In decreasing order of frequency, "C" (slightly unstable) stability occurred during 126 hours, or 28.8 percent of the time, and "B" (very unstable) stability occurred during 103 hours, or 23.6 percent of the time. "A" (extremely unstable) stability did not occur during June.

The lapse rate method of stability determination $(\frac{dT}{dZ})$ was not available during June since the $(\frac{dT}{dZ})$ sensors were down throughout the month.

Using the standard deviation of the horizontal wind (σ_Θ) method of stability determination, "E" stability was the most common stability classification at the meteorological tower at the 200-foot level because of the moderately strong winds that normally occurred at that location. The stability distributions for the 30-, 100-, and 200-foot levels were similar with the "E" stability classification the most common. The 8-foot level of the tower exhibited higher percentages of the unstable classes because of excessive mechanical turbulence.

The bivane at the 200-foot level of the meteorological tower indicated a pattern of upward vertical motion (negative vertical directions) during daytime hours in June. During late evening hours, the bivane indicated downward vertical motions. During the early morning hours, the bivane indicated no set pattern of vertical directions. The 30- and 100-foot level bivanes were not in operation during June.

The σ_Θ value obtained at the 200-foot level using the bivane compared favorably with the σ_Θ value obtained using standard wind instrumentation. However, this comparison is based on only the first eight days of June. After this time period, no σ_Θ values were obtained using the bivane at the 200-foot level because of instrumentation problems. No comparison may be made for the 30- and 100-foot levels since the bivanes were not in operation at those levels.

VI. DATA PRESENTATION AND SUMMARY

This section includes summaries for various recorded data at the monitoring sites. The data presentations indicate the variability of pollutant concentrations and meteorological parameters with location and time. In addition, the presentations indicate the functional dependence of pollutant concentration with wind direction. All data except suspended particulates (24-hour samples) are sampled once each second, but recorded as five-minute arithmetic averages of the one-second samples. This averaging technique tends to smooth instantaneous maximum values, and is especially evident when comparing wind gusts to local weather bureau data.

Inherent to any data acquisition system is random noise both from the recording instruments and quantization in the analog-to-digital conversion. The lower threshold for all analytical instruments is twice the maximum noise level generated by the instruments. This lower threshold is 5 ppb for all instruments, except for the ozone analyzer, for which it is 0.5 ppb. Therefore, any values appearing in the data presentations that are less than 5 ppb indicate only a trace of pollutant in question and should not be construed to be absolute levels. In addition, the recorded quantity is simply random noise and averages tend toward zero. Thus, when concentrations are below the lower threshold of the analytical instruments they may appear as a zero entry in the data presentation which does not indicate absolute zero concentration.

All pollutant data (except for particulate data) is taken at the monitoring site in integer parts per billion (ppb) but is presented here in micrograms per cubic meter ($\mu g/m^3$)

assuming standard temperature and pressure of 25°C and 760 mmHg (1013.2 millibars), respectively. The scale factors required to convert μg/m³ at standard conditions back to ppb for the various pollutants are given in the following table.

POLLUTANT	TO CONVERT μg/m³ AT 25°C AND 760 mmHg TO ppb MULTIPLY BY
NO_x	.534
NO	.534
NO_2	.534
SO_2	.384
H_2S	.723
THC	1.536
CH_4	1.536
CO	.877
O_3	.512

The units of the meteorological parameters are given in the table. It should be noted here that inside temperature is monitored and recorded as a functional part of the system but is not presented in this report.

Table III displays the monthly statistics for each monitoring station for the month. To insure statistical significance, and to reduce the possibility of introducing a bias in the presentation, averages are computed only when at least 50 percent of the samples are present, except for relative humidity and temperature, in which case 75 percent of the samples are required. If less than the required samples are present for a particular parameter, that entry will be blank. The number of samples present for a particular channel is defined as the total possible number of five-minute samples for the averaging time less the computer downtime less the channel downtime less the channel calibration time. The averages in Table III are arithmetic averages with the following exceptions:

- Wind speed and wind direction are computed using a vector averaging technique where the wind speed is treated as the vector magnitude.
- Particulate averages are computed as the geometric mean.

Table IV displays the daily averages. Again, 50 percent of the five-minute samples are required in order to compute an average except for the cases of relative humidity and temperature which require 75 percent. A blank entry indicates an insufficient number of five-minute samples present for that day. Wind speed, wind direction, and particulate averages are computed the same way as described in Table III.

Table V presents the maximum daily five-minute average retained in the data base as well as the time of occurrence. A five-minute maximum average is printed if any samples are present for that day. Therefore, the maximum five-minute average for a channel which experienced considerable downtime or calibration time during the day in question may be misrepresentative of the maximum expected for that channel on that day.

Table VI indicates the five largest averages for various averaging times. The table shows the period of time covered by the average. Maxima are chosen so that time segments are independent. The maximum averages reported are found using a 'sliding average' technique with the exception of the 24-hour particulate average, which is computed from midnight to midnight. For averaging times less than or equal to three hours, the sliding average is stepped one five-minute sample at a time. For longer averaging times the step size is twelve samples or one hour. For averaging times less than or equal to one hour 100 percent of the five-minute samples must be present to compute an average. Averaging times greater than one hour require 90 percent. Whether or not a sliding average is computed is solely determined by the number of samples present in that averaging time and is independent of daily and monthly averaging criteria.

To demonstrate the functional dependence of recorded parameters upon wind direction, Table VII shows pollutant concentration displayed in a bi-variate distribution with wind direction. The tables display the total number of five-minute samples occurring in each concentration and wind speed class. The mean concentration for all samples occurring in each wind class are also shown. This distribution demonstrates the dependence of high pollutant concentrations upon wind direction. Appendix A shows the stability wind rose diagrams.

The wind speed classifications used in Appendix A are based on the Beaufort wind scale classification system. This is a system of estimating and reporting wind speeds, invented in the early nineteenth century by Admiral Beaufort of the British Navy. It was originally based on the effects of various wind speeds on the amount of canvas that a full-rigged frigate of the period could carry, but has since been modified and modernized. In its present form for international meteorological use it equates: (a) Beaufort force (or Beaufort number); (b) wind speed;

(c) descriptive terms; and (d) visible effects upon land objects or the sea surface. One land adaptation is the NRM wind scale.

The six basic wind speed classifications used in the report are: 1-3 knots, 4-6 knots, 7-10 knots, 11-16 knots, 17-21 knots, and winds of greater than 21 knots. The following table is a complete description of the Beaufort Wind Scale, taken from Physical Climatology, by Helmut Landsberg, 1969.

BEAUFORT WIND SCALE FOR OBSERVATIONS AT LAND STATIONS

Force	Explanatory Title	Specification for Use	Corresponding Limits of Wind Speed at 10 meters ab.grd.				
			Mi/hr.	Knots	Km/hr.	M/sec.	Ft/sec.
0	Calm............	Smoke rises vertically....................	<1	<1	<1	0.3	1
1	Light air........	Direction of wind shown by smoke drift, but not by wind vanes..................	1-3	1-3	1-5	0.3-1.5	1-5
2	Light breeze.....	Wind felt on face:leaves rustle:ordinary vane moved by wind.....................	4-7	4-6	6-11	1.6-3.3	6-11
3	Gentle breeze....	Leaves and small twigs in constant motion;wind extends light flat...........	8-12	7-10	12-19	3.4-5.4	12-18
4	Moderate breeze..	Raises dust and loose paper:small branches are moved.........................	13-18	11-16	20-28	5.5-7.9	19-26
5	Fresh breeze.....	Small trees in leaf begin to sway:wavelets formed on inland waters...........	19-24	17-21	29-38	8.0-10.7	27-35
6	Strong breeze....	Large branches in motion:whistling heard in telegraph wires:umbrellas used with difficulty............................	25-31	22-27	39-49	10.8-13.8	36-45
7	High wind........	Whole trees in motion:inconvenience felt when walking against wind..............	32-38	28-33	50-61	13.9-17.1	46-56
8	Fresh gale.......	Breaks twigs off trees:generally impedes progress.............................	39-46	34-40	62-74	17.2-20.7	57-68
9	Strong gale......	Slight structural damage occurs (chimney pots and slates removed)..............	47-54	41-47	75-88	20.8-24.4	69-80
10	Whole gale.......	Seldom experienced inland:trees uprooted: considerable structural damage occurs...	55-63	48-55	89-102	24.5-28.4	81-93
11	Storm............	Very rarely experiences:accompanied by widespread damage......................	64-72	56-63	103-117	28.5-32.6	94-106
12	Hurricane........	....	73-82	64-71	118-133	32.7-36.9	107-121
13	....	....	83-92	72-80	134-149	37.0-41.4	122-136
14	....	....	93-102	81-89	150-166	41.5-46.1	137-151
15	....	....	104-114	90-99	167-183	46.2-50.9	152-166
16	....	....	115-125	100-108	184-201	51.0-56.0	167-183
17	....	....	126-136	109-118	202-220	56.1-61.2	184-201

Source: Table 36 (p.119) in R.J. List (1951):Smithsonian Meteorological Tables:Smithsonian Miscell.Coll.Vol. 114.

Table VIII demonstrates the diurnal variation of various recorded parameters. Hourly averages are determined by arithmetically averaging five-minute samples, except for wind direction averages which are computed vectorially assuming unit vector magnitudes. Totals in the diurnal wind direction tables are vector averages of the columns and rows. For all parameters, a blank entry in the diurnal variation table indicates that less than half (i.e., less than 6) of the five-minute samples for that hour are present.

All times given in the data presentation are Mountain Standard Time.

To facilitate comparison of recorded concentrations to ambient air quality standards, the following regulations are presented.

TABLE II

FEDERAL AND COLORADO STANDARDS

	Primary	Secondary	Non-Designated Area	Designated Area		
				1973	1976	1980
Particulate						
Annual G. M.	75 $\mu g/m^3$	60 $\mu g/m^3$	45 $\mu g/m^3$	70 $\mu g/m^3$	55 $\mu g/m^3$	45 $\mu g/m^3$
24 Hr. Max.*	260	150	150	200	180	150
Sulfur Oxides						
Annual	80(.03ppm)		--	60(.02ppm)	25(.009ppm)	10(.004ppm)
24 Hr. Max.*	365(.14ppm)		15(.005ppm)	300(.1ppm)	150(.05ppm)	55(.02ppm)
3 Hr. Max.*	--	1300(.5ppm)	--	--	--	--
1 Hr. Max.**	--	--	--	800(.28ppm)	300(.1ppm)	--
Oxidant						
1 Hr. Max.*	160(.08ppm)	160				
8 Hr. Max.*	--	--				
Annual	--	--				
Hydrocarbons						
3 Hr. Max.* 6-9 a.m.	160(.24ppm)	160				
Carbon Monoxide						
Max. 8 Hrs.*	10000(9ppm)	10000				
Max. 1 Hr.*	40000(35ppm)	40000				
Nitrogen Dioxide						
Annual	100(.05ppm)	100				

Units are micrograms per cubic meter and ppm in parenthesis.

*Not to be exceeded more than once per year.

**Not to be exceeded more than once per month.

TABLE III
AVERAGES FOR JUNE 1 THRU 30

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                    TABLE III, AVERAGES FOR JUNE  1 THRU 30
     (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
          TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
          PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

       NITROGEN OXIDES(NOX)              NITRIC OXIDE(NO)            NITROGEN DIOXIDE(NO2)

SITE    023                              023                         023
         .5                               .2                          .3
------------------------------------------------------------------------------------------

       SULFUR DIOXIDE(SO2)                  PYRANOMETER               SULFUR DIOXIDE(SO2)


SITE    023                              023                         023
         .1                          18575.9                         1.1
------------------------------------------------------------------------------------------

       TOTAL HYDROCARBONS                    METHANE               NON-METHANE HYDROCARBONS

SITE    023                              023                         023
     1137.4                            890.5                       248.7
------------------------------------------------------------------------------------------

        CARBON MONOXIDE                       OZONE                  BAROMETRIC PRESSURE

SITE    023                              023                         023
      275.1                             71.5                       791.3
------------------------------------------------------------------------------------------

       TOTAL PRECIPITATION                 PARTICULATE

SITE    023                              023
        .15                             14.9
------------------------------------------------------------------------------------------
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                    TABLE III. AVERAGES FOR JUNE  1 THRU 30
        (UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
             TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
             RADIATION FLUX-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                                    WIND SPEED

SITE 023
     (  8-FT)             ( 30-FT)             (100-FT)             (200-FT)
       2.9                  4.0                  4.6                  5.4
-------------------------------------------------------------------------------------

                                  WIND DIRECTION

SITE 023
     (  8-FT)             ( 30-FT)             (100-FT)             (200-FT)
     221.7                213.1                211.6                222.6
-------------------------------------------------------------------------------------

                                 RELATIVE HUMIDITY

SITE 023
     (  8-FT)             ( 30-FT)             (100-FT)             (200-FT)

-------------------------------------------------------------------------------------

                                    TEMPERATURE

SITE 023
     (  8-FT)             ( 30-FT)             (100-FT)             (200-FT)
      65.5                 67.6                 67.1
-------------------------------------------------------------------------------------
```

TABLE IV
DAILY AVERAGES FOR JUNE 1 THRU 30

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

	NITROGEN OXIDES(NOX)	NITRIC OXIDE(NO)	NITROGEN DIOXIDE(NO2)
SITE	023	023	023
DATE			
6/ 1		.0	
6/ 2		.0	
6/ 3	.0	.0	.0
6/ 4	.0	.0	.0
6/ 5	.0	.0	.0
6/ 6	.0	.0	.0
6/ 7	.0	.0	.0
6/ 8	.0	.0	.0
6/ 9	.0	.0	.0
6/10	.0	.0	.0
6/11	.0	.0	.0
6/12	.2	.2	.0
6/13	1.3	1.3	.0
6/14	.2	.2	.0
6/15			
6/16			
6/17			
6/18			
6/19			
6/20			
6/21			
6/22			
6/23			
6/24	2.6	.9	1.7
6/25	.5	.0	.5
6/26	.7	.0	.0
6/27	1.4	1.0	.3
6/28	3.7	.4	3.3
6/29	.8	.1	.8
6/30	2.4	2.1	.3

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30

(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

	SULFUR DIOXIDE(SO2)	PYRANOMETER	SULFUR DIOXIDE(SO2)
SITE	023	023	023
DATE			
6/ 1	.0	421.6	.4
6/ 2	.0	640.2	.3
6/ 3	1.6	683.8	.0
6/ 4	.3	620.3	.0
6/ 5	.0	575.3	.0
6/ 6	.0	433.8	.3
6/ 7	.0	380.1	3.2
6/ 8	.0	498.8	1.3
6/ 9	.0	591.4	1.3
6/10	.7	657.0	
6/11	.5	789.6	.0
6/12	.0	733.3	.1
6/13	.0	722.5	.4
6/14	.0	739.5	.3
6/15	.0	736.8	.0
6/16		715.4	
6/17	.0	732.0	1.0
6/18	.0	741.8	.8
6/19	.0	743.8	4.5
6/20	.0	564.5	2.5
6/21	.0	541.8	4.4
6/22	.0	554.3	3.3
6/23	.3	605.5	5.6
6/24	.0	484.7	1.6
6/25	.0	489.7	.0
6/26	.0	653.4	.0
6/27	.1	589.1	.2
6/28	.0	663.5	.2
6/29	.0	649.1	.0
6/30	.3	723.2	.1

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30

(UNITS:(CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

	TOTAL HYDROCARBONS	METHANE	NON-METHANE HYDROCARBONS
SITE	023	023	023
DATE			
6/ 1	1234.5		
6/ 2	1152.6		
6/ 3	1120.8	878.8	242.0
6/ 4	1162.4	884.4	278.0
6/ 5	1155.1	889.1	266.1
6/ 6	1150.7	891.0	259.7
6/ 7	1142.8	891.7	251.1
6/ 8	1134.0	895.1	238.9
6/ 9	1060.6	887.4	173.2
6/10	1070.8	879.8	191.1
6/11	1078.9	871.0	207.9
6/12	1103.5	874.3	229.0
6/13	1096.1	874.3	221.8
6/14	1080.8	856.8	223.9
6/15	1204.6	862.5	342.2
6/16		913.0	
6/17		920.6	
6/18		920.6	
6/19		902.9	
6/20	1094.0	903.0	191.0
6/21	1119.5	902.1	217.4
6/22	1152.1	915.2	235.5
6/23	1187.0	936.1	256.9
6/24			
6/25			
6/26			
6/27			
6/28	1182.3	839.1	343.2
6/29	1211.3	856.0	355.3
6/30	1200.9	858.5	342.4

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

	CARBON MONOXIDE	OZONE	BAROMETRIC PRESSURE
SITE	023	023	023
DATE			
6/ 1		82.0	792.7
6/ 2		76.7	790.5
6/ 3	302.0	82.2	791.3
6/ 4	290.6	86.5	794.4
6/ 5	290.3	88.6	795.7
6/ 6	280.0	81.8	795.3
6/ 7	276.9	82.1	792.8
6/ 8	273.6	67.8	788.3
6/ 9	252.8	88.3	787.7
6/10		84.1	790.5
6/11		65.7	790.9
6/12		99.9	789.8
6/13		105.0	790.3
6/14		99.5	791.2
6/15	275.2	80.5	791.4
6/16	291.6	99.6	790.7
6/17	285.0	97.7	789.7
6/18	282.4	116.4	789.4
6/19	279.7	104.5	789.5
6/20	250.2	119.1	788.4
6/21	245.9	117.7	789.9
6/22	275.2	114.8	791.2
6/23	265.5	107.3	791.8
6/24	244.4	91.7	793.0
6/25	223.5	91.3	792.7
6/26		81.0	792.6
6/27	255.1	78.8	792.3
6/28	262.4	64.5	793.4
6/29	288.2	77.8	790.3
6/30	258.0	69.2	790.9

TABLE IV, DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

	TOTAL PRECIPITATION	PARTICULATE
SITE	025	023
DATE		
6/ 1		17.0
6/ 2		28.0
6/ 3		
6/ 4		
6/ 5		
6/ 6		
6/ 7		
6/ 8		
6/ 9	.15	
6/10		26.0
6/11		15.0
6/12		8.0
6/13		14.0
6/14		7.0
6/15		
6/16		15.0
6/17		22.0
6/18		13.0
6/19		21.0
6/20		2.0
6/21		14.0
6/22		17.0
6/23		16.0
6/24		18.0
6/25		21.0
6/26		16.0
6/27		14.0
6/28		21.0
6/29		24.0
6/30		

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED

SITE 023

DATE	(7-FT)	(30-FT)	(100-FT)	(200-FT)
6/ 1	.9	1.3	1.4	1.6
6/ 2	4.3	5.9	7.2	8.5
6/ 3	4.1	5.7	7.4	8.9
6/ 4	2.1	3.3	4.6	4.8
6/ 5	2.7	3.9	4.6	5.2
6/ 6	2.7	4.2	5.2	5.6
6/ 7	1.5	2.2	2.5	2.7
6/ 8	.9	1.4	2.3	3.3
6/ 9	6.8	9.2	10.7	11.9
6/10	6.1	8.1	9.4	10.0
6/11	5.6	7.4	8.7	9.5
6/12	4.1	5.6	6.8	7.6
6/13	5.7	8.0	9.6	10.5
6/14	6.5	9.2	12.1	14.3
6/15	5.7	7.7	9.6	11.2
6/16	5.6	7.5	9.3	10.8
6/17	5.7	7.6	9.1	10.4
6/18	6.2	8.5	10.8	12.6
6/19	6.3	8.5	9.5	9.9
6/20	7.2	9.6	11.6	13.2
6/21	1.4	2.1	2.6	3.2
6/22	1.9	2.7	3.5	3.9
6/23	.5	.6	.7	.9
6/24	.6	1.3	2.1	2.4
6/25	.9	1.2	1.6	2.7
6/26	2.3	2.9	3.4	4.1
6/27	3.6	4.9	5.8	6.4
6/28	2.1	2.6	3.5	4.0
6/29	3.9	5.3	6.0	6.5
6/30	3.2	4.1	4.6	5.2

RADIAN CORPORATION

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND DIRECTION

SITE 023

DATE	(8-FT)	(30-FT)	(100-FT)	(200-FT)
6/ 1	281.6	270.1	291.4	308.4
6/ 2	216.7	213.1	213.8	223.9
6/ 3	207.1	195.2	193.5	207.1
6/ 4	133.0	125.6	124.7	132.7
6/ 5	159.0	148.9	143.7	147.4
6/ 6	151.2	149.0	141.6	147.5
6/ 7	199.8	185.2	175.9	182.5
6/ 8	222.4	203.0	193.9	209.5
6/ 9	206.8	200.1	200.2	210.4
6/10	210.6	206.9	205.2	214.9
6/11	215.2	207.6	208.0	220.5
6/12	219.7	211.9	215.0	226.7
6/13	200.3	195.4	194.2	206.2
6/14	215.9	205.8	203.6	214.2
6/15	220.5	218.0	217.1	227.4
6/16	216.0	210.0	212.8	223.0
6/17	212.9	207.3	208.9	218.5
6/18	230.1	221.1	218.7	226.8
6/19	190.3	190.2	188.2	197.7
6/20	215.3	208.9	210.2	219.3
6/21	297.7	301.0	311.7	322.0
6/22	295.4	290.1	301.0	312.4
6/23	219.5	219.6	220.4	235.5
6/24	127.3	133.1	133.3	152.8
6/25	226.5	210.2	196.0	223.6
6/26	310.4	306.7	312.6	310.3
6/27	302.6	290.6	300.8	303.6
6/28	321.2	313.2	321.5	326.7
6/29	295.7	287.1	296.0	299.6
6/30	305.2	292.5	309.6	314.8

TABLE IV. DAILY AVERAGES FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRHELIOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

SITE #25

DATE	(6-FT)	(30-FT)	(100-FT)	(200-FT)
6/ 1				
6/ 2				
6/ 3				
6/ 4				
6/ 5				
6/ 6				
6/ 7				
6/ 8				
6/ 9				
6/10	61.4	62.0	61.8	
6/11	65.4	63.8	63.5	
6/12	65.8	64.6	64.4	
6/13	67.6	68.9	68.6	
6/14	68.7	69.8	69.7	
6/15	67.2	68.7	68.7	
6/16	66.7	67.7	67.1	
6/17	69.0	70.0	69.3	
6/18	67.2	68.4	68.1	
6/19	65.4	66.8	66.3	
6/20	65.0	66.8	66.0	
6/21	60.5	62.2	61.7	
6/22	61.[illegible]	63.6	63.0	
6/23	65.7	66.8	66.3	
6/24	65.2	66.1	65.6	
6/25	67.7	68.1	67.6	
6/26	71.3	71.6	70.3	
6/27	72.9	73.4	72.3	
6/28	69.5	70.8	69.7	
6/29	69.3	70.5	69.8	
6/30	69.1	70.7	69.7	

TABLE V
MAXIMUM FIVE-MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE 1 THRU 30

```
        TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
    (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
             TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
             PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                               NITROGEN OXIDES(NOX)

    SITE     023
DATE
------------------------------------------------------------------------------------------------------------------------------
 6/ 1          1.9( 3:55)
 6/ 2           .0(14:00)
 6/ 3          1.9(13:15)
 6/ 4          1.9( 0:45)
 6/ 5          1.9( 8:35)
 6/ 6           .0( 0:00)
 6/ 7           .0( 0:00)
 6/ 8           .0( 0:00)
 6/ 9           .0( 0:00)
 6/10           .0( 0:00)
------------------------------------------------------------------------------------------------------------------------------
 6/11           .0( 0:00)
 6/12          1.9( 3:50)
 6/13          3.7( 6:25)
 6/14          1.9( 0:00)
 6/15          1.9( 3:35)
 6/16
 6/17
 6/18
 6/19
 6/20           .0( 2:35)
------------------------------------------------------------------------------------------------------------------------------
 6/21
 6/22
 6/23
 6/24         65.5(13:50)
 6/25         16.7( 1:25)
 6/26           .0( 0:00)
 6/27         13.7(14:35)
 6/28         69.3(15:55)
 6/29         18.7(18:55)
 6/30         24.3( 3:10)
```

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TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE 1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

NITRIC OXIDE(NO)

SITE DATE	025
6/ 1	1.9(3:55)
6/ 2	.0(0:00)
6/ 3	.0(0:00)
6/ 4	.0(0:00)
6/ 5	1.9(8:55)
6/ 6	.0(0:00)
6/ 7	.0(0:00)
6/ 8	.0(0:00)
6/ 9	.0(0:00)
6/10	.0(0:00)
6/11	.0(0:00)
6/12	1.9(4:20)
6/13	5.7(6:25)
6/14	1.9(0:00)
6/15	1.9(3:55)
6/16	
6/17	
6/18	
6/19	
6/20	.0(2:55)
6/21	
6/22	.0(1:45)
6/23	
6/24	37.6(13:50)
6/25	.0(0:00)
6/26	.0(0:00)
6/27	16.7(14:55)
6/28	15.7(0:00)
6/29	15.1(22:50)
6/30	24.3(3:10)

CORPORATION

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    TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
  (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
        TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
        PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              NITROGEN DIOXIDE(NO2)

     SITE       023
DATE
------------------------------------------------------------------------------------------
 6/ 1           .0( 0:00)
 6/ 2           .0(14:00)
 6/ 3          1.9(13:15)
 6/ 4          1.9( 0:45)
 6/ 5           .0( 0:00)
 6/ 6           .0( 0:00)
 6/ 7           .0( 0:00)
 6/ 8           .0( 0:00)
 6/ 9           .0( 0:00)
 6/10           .0( 0:00)
------------------------------------------------------------------------------------------
 6/11           .0( 0:00)
 6/12          1.9( 3:30)
 6/13           .0( 0:00)
 6/14           .0( 0:00)
 6/15           .0( 0:00)
 6/16
 6/17
 6/18
 6/19
 6/20           .0( 2:55)
------------------------------------------------------------------------------------------
 6/21
 6/22
 6/23
 6/24         20.1(13:50)
 6/25         10.7( 1:25)
 6/26           .0( 0:00)
 6/27         10.9(23:45)
 6/28         67.3(13:55)
 6/29         16.7(16:55)
 6/30         11.2( 1:35)
```

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TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
        TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
        PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              SULFUR DIOXIDE(SO2)

     SITE      023
DATE
--------------------------------------------------------------------------------------------
 6/ 1         2.6( 4:50)
 6/ 2          .0( 0:00)
 6/ 3         2.6( 3:25)
 6/ 4         2.6( 0:00)
 6/ 5         2.6( 1:55)
 6/ 6         2.6( 3:55)
 6/ 7         2.5( 0:45)
 6/ 8          .0( 0:00)
 6/ 9          .0( 0:00)
 6/10        18.2( 9:30)
--------------------------------------------------------------------------------------------
 6/11         5.2( 0:30)
 6/12          .0( 0:00)
 6/13          .0( 0:00)
 6/14          .0( 0:00)
 6/15          .0( 0:00)
 6/16
 6/17          .0( 0:00)
 6/18          .0( 0:00)
 6/19          .0( 0:00)
 6/20          .0( 0:00)
--------------------------------------------------------------------------------------------
 6/21          .0( 0:00)
 6/22          .0( 0:00)
 6/23          .0( 0:00)
 6/24          .0( 0:00)
 6/25          .0( 0:00)
 6/26          .0( 0:00)
 6/27        23.4( 8:35)
 6/28          .0( 0:00)
 6/29          .0( 0:00)
 6/30          .0( 0:00)
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    TABLE 4. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
        TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
        PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              PYRANOMETER

     SITE      025
DATE
---------------------------------------------------------------------------------------
 6/ 1        8.25(12:50)
 6/ 2        7.90(11:55)
 6/ 3        8.05(11:50)
 6/ 4        7.60(12:55)
 6/ 5        7.80(12:15)
 6/ 6        7.70(13:00)
 6/ 7        6.55( 9:55)
 6/ 8        7.05(10:40)
 6/ 9        7.15(11:35)
 6/10        7.80(12:55)
---------------------------------------------------------------------------------------
 6/11        7.30(13:15)
 6/12        7.05(11:50)
 6/13        7.10(11:40)
 6/14        7.20(11:50)
 6/15        7.15(12:00)
 6/16        7.15(12:25)
 6/17        7.35(11:55)
 6/18        7.15(11:50)
 6/19        7.20(12:00)
 6/20        6.55(12:20)
---------------------------------------------------------------------------------------
 6/21        8.10(13:40)
 6/22        8.25(12:35)
 6/23        7.60(13:05)
 6/24        8.05(13:15)
 6/25        6.20(13:25)
 6/26        7.50(12:30)
 6/27        7.95(10:35)
 6/28        7.05(12:00)
 6/29        8.05(11:40)
 6/30        7.00(11:55)
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      TABLE V.  MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
    (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
            TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
            PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              SULFUR DIOXIDE(SO2)

    SITE      023
DATE
--------------------------------------------------------------------------------------------
 6/ 1         5.2( 0:50)
 6/ 2         5.2(10:40)
 6/ 3         2.5(16:40)
 6/ 4         2.6(12:35)
 6/ 5          .0( 0:00)
 6/ 6         2.6( 3:30)
 6/ 7        10.4(10:30)
 6/ 8        10.4( 8:35)
 6/ 9         7.8(22:35)
 6/10         5.2( 0:55)
--------------------------------------------------------------------------------------------
 6/11          .0( 3:25)
 6/12         5.2( 3:25)
 6/13         2.6( 0:35)
 6/14         5.2( 0:55)
 6/15          .0( 0:00)
 6/16
 6/17         5.2( 3:45)
 6/18         5.2(23:20)
 6/19        33.9( 8:45)
 6/20        28.7( 4:00)
--------------------------------------------------------------------------------------------
 6/21        13.0( 5:30)
 6/22        18.2( 8:05)
 6/23        36.5( 6:35)
 6/24        15.6( 4:25)
 6/25          .0( 0:00)
 6/26          .0( 0:00)
 6/27        44.3( 8:35)
 6/28         2.6( 1:40)
 6/29         5.2( 9:10)
 6/30         2.6( 3:55)
```

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CORPORATION

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    TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
  (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
         TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
         PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                                   TOTAL HYDROCARBONS

    SITE      023
DATE
------------------------------------------------------------------------------------------
 6/ 1     1474.4( 7:35)
 6/ 2     1571.4(12:50)
 6/ 3     1211.9(12:20)
 6/ 4     1321.5(10:00)
 6/ 5     1210.5(11:20)
 6/ 6     1327.9(13:45)
 6/ 7     1235.4(10:05)
 6/ 8     1420.8(14:05)
 6/ 9     1150.1( 7:30)
 6/10     2315.3( 2:30)
------------------------------------------------------------------------------------------
 6/11     1265.2( 8:25)
 6/12     1198.9( 6:50)
 6/13     1163.1(10:50)
 6/14     1152.7( 7:40)
 6/15     1567.5(12:55)
 6/16
 6/17
 6/18
 6/19
 6/20     1144.9(17:00)
------------------------------------------------------------------------------------------
 6/21     1275.1( 9:50)
 6/22     1324.6(14:00)
 6/23     1295.9(10:20)
 6/24     1219.8( 1:20)
 6/25
 6/26
 6/27     1155.6(20:35)
 6/28     1252.0(13:15)
 6/29     2102.7(21:55)
 6/30     1703.6( 0:20)
```

```
     TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
   (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
        TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
        PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                                   METHANE

     SITE     025
DATE
------------------------------------------------------------------------------------------
 6/ 1      1167.8( 2:30)
 6/ 2      1022.4(14:10)
 6/ 3       901.5(16:30)
 6/ 4       909.6(11:50)
 6/ 5       907.8(16:10)
 6/ 6       915.0( 9:25)
 6/ 7       925.4(17:10)
 6/ 8      1121.2(14:10)
 6/ 9       915.6( 8:15)
 6/10       900.0( 9:40)
------------------------------------------------------------------------------------------
 6/11       882.4( 1:45)
 6/12       892.2(18:15)
 6/13       894.1(12:25)
 6/14       881.1( 7:15)
 6/15      1309.0(10:50)
 6/16       936.4(15:40)
 6/17       946.2( 2:05)
 6/18       943.0(14:30)
 6/19       940.4( 2:50)
 6/20       960.0( 4:50)
------------------------------------------------------------------------------------------
 6/21      1027.6( 9:50)
 6/22       774.5( 9:00)
 6/23       984.0(19:30)
 6/24       976.1( 0:05)
 6/25
 6/26
 6/27      1258.6(10:15)
 6/28       859.6(13:15)
 6/29      1566.2(21:55)
 6/30      1259.3( 0:20)
```

```
        TABLE 7. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
     (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
            TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
            PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              NON-METHANE HYDROCARBONS

    STN      023
DATE
--------------------------------------------------------------------------------------------
 6/ 1       527.6( 7:35)
 6/ 2       270.3(23:40)
 6/ 3       338.0(12:20)
 6/ 4       451.1(10:00)
 6/ 5       320.3(10:15)
 6/ 6       442.2(13:45)
 6/ 7       361.9(10:05)
 6/ 8       356.2(14:05)
 6/ 9       250.1( 7:25)
 6/10      1942.6( 2:30)
--------------------------------------------------------------------------------------------
 6/11       372.5( 8:25)
 6/12       350.2( 8:50)
 6/13       266.5(10:50)
 6/14       291.1( 7:40)
 6/15       705.3(12:35)
 6/16
 6/17
 6/18
 6/19
 6/20       262.6(17:00)
--------------------------------------------------------------------------------------------
 6/21       291.1(14:50)
 6/22       347.3(14:40)
 6/23       374.8( 9:55)
 6/24       259.6( 1:20)
 6/25
 6/26
 6/27       511.3(12:25)
 6/28       591.6(16:05)
 6/29       657.1(21:50)
 6/30       499.5( 8:10)
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TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
(CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
        TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
        PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              CARBON MONOXIDE

   SITE     025
DATE
-------------------------------------------------------------------------------------
 6/ 1     3599.0( 6:30)
 6/ 2      349.9( 2:00)
 6/ 3      336.2( 0:10)
 6/ 4      324.8(12:45)
 6/ 5      308.4( 7:25)
 6/ 6      326.2( 5:45)
 6/ 7      355.6(10:10)
 6/ 8      417.1(11:15)
 6/ 9      372.7(23:05)
 6/10     5694.6( 2:40)
-------------------------------------------------------------------------------------
 6/11
 6/12
 6/13
 6/14
 6/15      311.1(11:40)
 6/16      332.5(22:05)
 6/17      319.1( 5:50)
 6/18      322.5(12:05)
 6/19      329.2(11:05)
 6/20      291.2(19:00)
-------------------------------------------------------------------------------------
 6/21      347.3(16:15)
 6/22      320.1(20:20)
 6/23      341.9(15:40)
 6/24      274.7( 6:25)
 6/25      201.4( 4:20)
 6/26
 6/27     1769.9(10:15)
 6/28      319.1(15:15)
 6/29      340.5( 1:25)
 6/30     3106.9( 6:05)
```

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TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

OZONE

SITE DATE	023
6/ 1	97.7(17:15)
6/ 2	91.8(14:50)
6/ 3	97.7(18:00)
6/ 4	97.7(10:50)
6/ 5	105.5(15:15)
6/ 6	95.7(9:40)
6/ 7	97.7(14:55)
6/ 8	103.5(18:20)
6/ 9	105.5(8:30)
6/10	101.6(12:25)
6/11	97.7(7:45)
6/12	119.2(14:50)
6/13	125.1(18:55)
6/14	127.0(10:40)
6/15	97.7(8:00)
6/16	125.0(17:05)
6/17	125.1(9:35)
6/18	150.4(15:20)
6/19	110.6(10:35)
6/20	114.6(18:55)
6/21	150.3(10:20)
6/22	133.7(15:10)
6/23	125.0(11:15)
6/24	147.5(10:00)
6/25	121.1(16:55)
6/26	95.7(9:30)
6/27	93.8(12:35)
6/28	82.1(9:25)
6/29	87.9(20:30)
6/30	82.1(0:00)

```
TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
(UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
      TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
      PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              BAROMETRIC PRESSURE

    SITE      025
DATE
--------------------------------------------------------------------------------
 6/ 1       795.0( 0:00)
 6/ 2       792.0( 6:40)
 6/ 3       795.0(22:30)
 6/ 4       790.0(22:05)
 6/ 5       797.0( 0:00)
 6/ 6       797.0( 6:00)
 6/ 7       795.0( 4:40)
 6/ 8       791.0( 0:05)
 6/ 9       795.0( 6:40)
 6/10       792.0(21:40)
--------------------------------------------------------------------------------
 6/11       792.0( 0:00)
 6/12       791.0( 4:45)
 6/13       792.0( 6:20)
 6/14       792.0( 5:50)
 6/15       793.0( 5:45)
 6/16       792.0( 4:40)
 6/17       792.0( 0:45)
 6/18       790.0( 4:45)
 6/19       791.0( 2:00)
 6/20       790.0( 5:20)
--------------------------------------------------------------------------------
 6/21       795.0(22:00)
 6/22       795.0( 7:55)
 6/23       795.0( 6:45)
 6/24       796.0( 5:20)
 6/25       794.0( 0:00)
 6/26       794.0( 5:20)
 6/27       794.0( 8:10)
 6/28       790.0( 7:45)
 6/29       792.0( 0:00)
 6/30       792.0( 5:40)
```

```
        TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE  1 THRU 30
      (UNITS:CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
            TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
           PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

                              TOTAL PRECIPITATION

    SITE      023
DATE
------------------------------------------------------------------------------------------------
 6/ 1
 6/ 2
 6/ 3
 6/ 4
 6/ 5
 6/ 6
 6/ 7
 6/ 8
 6/ 9        .10( 9:55)
 6/10
------------------------------------------------------------------------------------------------
 6/11
 6/12
 6/13
 6/14
 6/15
 6/16
 6/17
 6/18
 6/19
 6/20
------------------------------------------------------------------------------------------------
 6/21
 6/22
 6/23
 6/24
 6/25
 6/26
 6/27
 6/28
 6/29
 6/30
```

TABLE V. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETER-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

WIND SPEED - WIND DIRECTION

SITE 023

DATE	(6-FT)		(30-FT)		(100-FT)		(200-FT)	
6/ 1	12.0	15.0(11:10)	15.0	9.0(11:10)	15.0	20.0(11:10)	16.0	265.0(16:50)
6/ 2	16.0	244.0(14:10)	21.0	295.0(16:25)	24.0	215.0(18:55)	27.0	223.0(18:55)
6/ 3	14.0	202.0(8:40)	16.0	192.0(7:20)	19.0	191.0(7:20)	20.0	200.0(7:20)
6/ 4	20.0	139.0(17:25)	27.0	133.0(17:25)	31.0	137.0(17:25)	32.0	136.0(17:25)
6/ 5	14.0	195.0(19:20)	20.0	191.0(19:20)	24.0	189.0(19:20)	28.0	195.0(19:20)
6/ 6	15.0	161.0(14:30)	17.0	155.0(14:30)	20.0	102.0(17:40)	22.0	102.0(17:40)
6/ 7	15.0	350.0(16:50)	19.0	340.0(16:50)	21.0	341.0(16:50)	22.0	360.0(17:05)
6/ 8	16.0	230.0(22:30)	21.0	228.0(22:30)	25.0	228.0(22:30)	27.0	243.0(22:25)
6/ 9	21.0	221.0(17:00)	27.0	216.0(17:00)	32.0	213.0(17:00)	33.0	221.0(17:00)
6/10	18.0	190.0(10:15)	23.0	186.0(10:15)	25.0	188.0(10:15)	27.0	217.0(13:25)
6/11	20.0	191.0(11:50)	24.0	185.0(11:50)	28.0	184.0(11:50)	29.0	193.0(11:50)
6/12	16.0	215.0(14:20)	20.0	207.0(12:45)	23.0	214.0(15:50)	24.0	225.0(15:50)
6/13	17.0	229.0(16:05)	21.0	223.0(16:05)	25.0	221.0(16:05)	26.0	228.0(16:05)
6/14	20.0	225.0(11:30)	25.0	210.0(11:30)	27.0	207.0(11:30)	29.0	219.0(10:40)
6/15	20.0	205.0(13:15)	26.0	203.0(13:15)	30.0	205.0(13:15)	32.0	216.0(13:15)
6/16	17.0	191.0(13:15)	21.0	212.0(12:05)	24.0	199.0(13:10)	27.0	206.0(13:10)
6/17	15.0	215.0(14:30)	22.0	205.0(13:50)	24.0	210.0(14:30)	26.0	210.0(21:55)
6/18	18.0	256.0(13:00)	26.0	235.0(13:20)	26.0	236.0(13:20)	28.0	240.0(13:20)
6/19	17.0	190.0(18:05)	21.0	170.0(15:25)	25.0	176.0(18:05)	27.0	182.0(18:05)
6/20	16.0	200.0(10:20)	25.0	192.0(11:15)	28.0	191.0(11:15)	30.0	200.0(11:15)
6/21	14.0	268.0(16:15)	19.0	335.0(18:30)	23.0	340.0(18:30)	24.0	342.0(18:30)
6/22	12.0	302.0(13:05)	17.0	295.0(13:05)	18.0	294.0(13:05)	17.0	305.0(13:05)
6/23	17.0	257.0(19:35)	22.0	251.0(19:35)	26.0	257.0(19:35)	29.0	258.0(19:30)
6/24	15.0	125.0(14:00)	21.0	112.0(14:00)	22.0	116.0(14:00)	24.0	121.0(14:00)
6/25	16.0	4.0(18:25)	25.0	2.0(18:20)	30.0	8.0(18:20)	34.0	12.0(18:20)
6/26	19.0	195.0(0:25)	24.0	194.0(0:25)	29.0	200.0(0:25)	36.0	208.0(0:25)
6/27	15.0	329.0(14:30)	19.0	290.0(13:40)	21.0	292.0(13:40)	22.0	297.0(13:40)
6/28	13.0	300.0(15:55)	18.0	300.0(15:55)	19.0	299.0(15:55)	19.0	283.0(15:25)
6/29	17.0	317.0(13:30)	22.0	300.0(13:45)	24.0	304.0(13:45)	24.0	297.0(13:40)
6/30	12.0	322.0(10:40)	19.0	322.0(14:10)	21.0	323.0(14:10)	21.0	305.0(16:10)

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TABLE 7. MAXIMUM FIVE MINUTE AVERAGES AND TIME OF OCCURRENCE FOR JUNE 1 THRU 30
(UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
TEMPERATURE-DEGREES FAHRENHEIT; WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH;
PYRANOMETERS-TOTAL LANGLEYS; PRESSURE-MILLIBARS; PRECIPITATION-INCHES)

TEMPERATURE

SITE 025

DATE	(6-FT)	(30-FT)	(100-FT)	(200-FT)
6/ 1				
6/ 2				
6/ 3				
6/ 4				
6/ 5				
6/ 6				
6/ 7				
6/ 8				
6/ 9	75.0(13:45)	73.0(15:25)	71.0(15:25)	
6/10	76.0(15:30)	74.0(15:25)	71.0(15:25)	
6/11	79.0(16:35)	76.0(16:35)	73.0(16:35)	
6/12	79.0(14:20)	76.0(14:10)	73.0(13:55)	
6/13	84.0(15:05)	80.0(14:20)	78.0(16:20)	
6/14	85.0(13:20)	81.0(13:30)	78.0(13:30)	
6/15	82.0(13:10)	80.0(14:50)	77.0(14:50)	
6/16	83.0(15:10)	80.0(14:40)	77.0(15:25)	
6/17	85.0(14:55)	83.0(15:30)	79.0(14:30)	
6/18	82.0(13:55)	79.0(14:55)	76.0(14:55)	
6/19	82.0(13:50)	80.0(13:30)	77.0(13:30)	
6/20	77.0(12:20)	75.0(16:05)	72.0(14:35)	
6/21	77.0(13:25)	76.0(16:10)	73.0(15:35)	
6/22	80.0(16:10)	77.0(15:50)	74.0(16:00)	
6/23	83.0(15:45)	80.0(14:10)	78.0(15:45)	
6/24	84.0(13:55)	80.0(13:30)	77.0(13:30)	
6/25	84.0(13:40)	82.0(13:30)	78.0(13:20)	
6/26	85.0(16:00)	83.0(14:35)	80.0(16:15)	
6/27	85.0(13:40)	83.0(14:00)	80.0(14:00)	
6/28	85.0(15:25)	83.0(15:20)	80.0(15:25)	
6/29	87.0(14:10)	83.0(14:10)	80.0(16:40)	
6/30	86.0(14:20)	84.0(15:45)	80.0(14:50)	

TABLE VI
THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUNE 1 THRU 30

```
                    TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN   1-30
                                  (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                           UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                                  WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                             NITROGEN OXIDES[WS: WD]
                                                  1-HOUR
SITE                  023

 1. 6/28(15:20-16:20)  30.1[12:301]
 2. 6/24(12:50-13:50)  19.3[11:  8]
 3. 6/27(14:00-15:00)  11.4[14:298]
 4. 6/24(16:00-17:00)   9.7[ 8: 65]
 5. 6/25( 0:40- 1:40)   8.9[ 6:119]
------------------------------------------------------------------------------------------------------------------

                                             NITRIC OXIDE[WS: WD]
                                                  1-HOUR
SITE                  023

 1. 6/24(12:50-13:50)  11.5[11:  8]
 2. 6/27(14:00-15:00)  11.4[14:298]
 3. 6/27(15:10-16:10)   6.2[14:266]
 4. 6/30( 2:55- 3:55)   4.4[ 5:177]
 5. 6/27(21:45-22:45)   4.1[ 7:309]
------------------------------------------------------------------------------------------------------------------

                                             NITROGEN DIOXIDE[WS: WD]
                                                  1-HOUR
SITE                  023

 1. 6/28(15:20-16:20)  30.1[12:301]
 2. 6/24(16:00-17:00)   9.7[ 8: 65]
 3. 6/25( 0:40- 1:40)   8.9[ 6:119]
 4. 6/28(16:50-17:50)   6.9[10:323]
 5. 6/24(12:50-13:50)   7.8[11:  8]
------------------------------------------------------------------------------------------------------------------
```

```
TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN   1-30
                    (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                      WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                         SULFUR DIOXIDE[WS: WD]
                                           1-HOUR
SITE                023

 1. 6/23( 8:05- 9:05)  33.0[ 3:312]
 2. 6/19( 7:35- 8:35)  31.0[ 3:359]
 3. 6/23( 9:10-10:10)  20.6[ 4:352]
 4. 6/19( 8:40- 9:40)  16.9[11:191]
 5. 6/22( 7:20- 8:20)  13.9[ 4:358]
--------------------------------------------------------------------------------------------------

                                         TOTAL HYDROCARBONS[WS: WD]
                                           3-HOUR(6-9AM)
SITE                023

 1. 6/ 2( 6:00- 9:00)1242.5[ 5:145]
 2. 6/29( 6:00- 9:00)1202.7[ 2: 97]
 3. 6/ 7( 6:00- 9:00)1171.1[ 5:206]
 4. 6/ 4( 6:00- 9:00)1167.6[ 3:108]
 5. 6/ 5( 6:00- 9:00)1165.1[ 6:128]
   PRIMARY STANDARD EXCEEDED   17 TIMES AT SITE 023
 SECONDARY STANDARD EXCEEDED   17 TIMES AT SITE 023
--------------------------------------------------------------------------------------------------
```

```
                         TABLE VI. THE FIVE MAXIMUM AVERAGES FOR JUN   1-30
                                   (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                        UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                               WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                        METHANE[WS: WD]
                                         3-HOUR(6-9AM)
SITE               023

 1. 6/17( 6:00- 9:00) 927.6[ 2: 62]
 2. 6/18( 6:00- 9:00) 921.1[ 6:288]
 3. 6/20( 6:00- 9:00) 919.6[11:266]
 4. 6/21( 6:00- 9:00) 910.9[ 2:265]
 5. 6/16( 6:00- 9:00) 909.0[ 2: 68]
   PRIMARY STANDARD EXCEEDED  21 TIMES AT SITE 023
 SECONDARY STANDARD EXCEEDED  21 TIMES AT SITE 023
--------------------------------------------------------------------------------------------------
```

```
                    TABLE VI. THE FIVE MAXIMUM AVERAGES FOR JUN    1-30
                          (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                  UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                        WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                NON-METHANE HYDROCARBONS(WS: WD)
                                        3-HOUR(6-9AM)
SITE                 023

 1. 6/29( 6:00- 9:00) 350.3[ 2: 97]
 2. 6/ 4( 7:00- 9:00) 287.4[ 3:104]
 3. 6/ 7( 6:00- 9:00) 280.6[ 5:206]
 4. 6/ 5( 6:00- 9:00) 275.0[ 6:128]
 5. 6/ 3( 6:00- 9:00) 207.7[10:181]
   PRIMARY STANDARD EXCEEDED   16 TIMES AT SITE 023
 SECONDARY STANDARD EXCEEDED   16 TIMES AT SITE 023
------------------------------------------------------------------------------------------------
```

```
          TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN    1-30
                     (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                 UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                        WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                         CARBON MONOXIDE( S: 60)
                                            1-HOUR

SITE             923

 1. 6/10( 0:05- 1:05) 714.3( 3:170)
 2. 6/10( 1:55- 2:55) 707.6( 3:245)
 3. 6/ 1( 8:25- 9:25) 630.7( 5:351)
 4. 6/30( 8:00- 9:00) 487.3( 5:  9)
 5. 6/27(10:10-11:10) 377.7( 7:333)
--------------------------------------------------------------------------------------------------------
```

```
          TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN   1-30
                  (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
            UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                  WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                              CARBON MONOXIDE(WS: WD)
                                  8-HOUR
SITE            023

 1. 6/ 9(22:55- 6:55) 383.5[ 3:170]
 2. 6/ 2(21:55- 5:55) 313.5[ 6:135]
 3. 6/30( 0:55- 8:55) 303.1[ 3:199]
 4. 6/17( 1:55- 9:55) 301.5[ 2:103]
 5. 6/ 3( 6:55-14:55) 301.0[11:210]
--------------------------------------------------------------------------------------------
```

```
        TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN   1-30
                   (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
              UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                        WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                      OZONE(AS: O3)
                                         1-HOUR
SITE                023

 1. 6/18(14:50-15:50) 147.5[18:219]
 2. 6/18(15:55-16:55) 143.6[14:234]
 3. 6/19(10:05-11:05) 142.5[16:197]
 4. 6/20(18:10-19:10) 140.3[12:246]
 5. 6/20(16:05-17:05) 139.5[16:218]
--------------------------------------------------------------------------------------------------
```

```
                    TABLE VI. THE FIVE MAXIMUM AVERAGES FOR JUN    1-30
                    UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER

                                      PARTICULATE
                                        24-HOUR
SITE              023

          1     6/ 2     28.0
          2     6/16     26.0
          3     6/29     24.0
          4     6/17     22.0
          5     6/19     21.0
-------------------------------------------------------------------------------
```

TABLE VII

FUNCTIONAL DEPENDENCE OF RECORDED PARAMETERS UPON WIND DIRECTION

```
                  NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

      NITROGEN OXIDES(NOX)                                          C-B SHALE OIL PROJECT
                          TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                        WIND DIRECTION
                    N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW  CALM   TOTAL
 CONCENTRATION
   UG/M**3
    GT    160 :                                                                                                      :
 140  -   160 :                                                                                                      :
 120  -   140 :                                                                                                      :
 110  -   120 :                                                                                                      :
 100  -   110 :                                                                                                      :
  90  -   100 :                                                                                                      :
  80  -    90 :                                                                                                      :
  70  -    80 :                                                                                                      :
  60  -    70 :         1                                                           1     1                          :      3
  50  -    60 :         1                                                           0     0     1                    :      2
  40  -    50 :         1     1                                                     0     0     1                    :      3
  30  -    40 :         0     0                                                     0     0     1                    :      1
  20  -    30 :   2     0     0                             1     1           1     2     1     2     3              :     13
  10  -    20 :   2     0     2     1     4     2     2     1     1     3     0     6    14    11     7              :     56
    LT     10 : 180   125   173   142   278   292   346   382   533  1037   641   219   156   276   240   195    54  :   5313
    TOTAL     : 186   128   176   143   282   294   348   384   535  1040   642   219   165   292   256   205    54  :   5391
              ...........................................................................................................

    MEAN          0.    2.    0.    0.    0.    0.    0.    0.    0.    0.    0.    0.    2.    1.    2.    0.    0.      0.
```

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NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

C-B SHALE OIL PROJECT

NITRIC OXIDE(NO)

TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

CONCENTRATION UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
GT 160																		
140 - 160																		
120 - 140																		
110 - 120																		
100 - 110																		
90 - 100																		
80 - 90																		
70 - 80																		
60 - 70																		
50 - 60																		
40 - 50																		
30 - 40		1																1
20 - 30	1	1	1					1	1		1		1					7
10 - 20	0	1	0		2			0	0	1	0		4	8	9	2		27
LT 10	196	137	176	198	285	307	361	397	556	1106	685	240	170	297	257	207	55	5630
TOTAL	197	140	177	198	287	307	361	398	557	1107	686	240	175	305	266	209	55	5665
MEAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NITROGEN DIOXIDE(NO2) C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

CONCENTRATION UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
									WIND DIRECTION									
GT 160																		
140 - 160																		
120 - 140																		
110 - 120																		
100 - 110																		
90 - 100																		
80 - 90																		
70 - 80																		
60 - 70													1	1				2
50 - 60													0	0	1			1
40 - 50													0	0	1			1
30 - 40													0	0	1			1
20 - 30	1	3											1	1	2	3		11
10 - 20	2	0	3	1	2	2	2		1	2			2	6	2	5		30
LT 10	185	125	173	182	280	292	346	384	534	1038	642	219	161	284	249	197	54	5345
TOTAL	188	128	176	183	282	294	348	384	535	1040	642	219	165	292	256	205	54	5391
MEAN	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.

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```
                   NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

       SULFUR DIOXIDE(SO2)                                                C-B SHALE OIL PROJECT
                          TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                            WIND DIRECTION
                 N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW CALM   TOTAL
CONCENTRATION
  UG/M**3                                                                                          :
  GT   140 :
                                                                                                   :
130 -  140 :
                                                                                                   :
120 -  130 :
                                                                                                   :
110 -  120 :
                                                                                                   :
100 -  110 :
                                                                                                   :
 90 -  100 :
                                                                                                   :
 80 -   90 :
                                                                                                   :
 70 -   80 :
                                                                                                   :
 60 -   70 :
                                                                                                   :
 50 -   60 :
                                                                                                   :
 40 -   50 :
                                                                                                   :
 30 -   40 :
                                                                                                   :     1
 20 -   30 :                1
                                                                  1                                :     1
 10 -   20 :                0
   LT   10 :   322  217  229  267  354  367  443  504  757 1685 1148  386  257  413  389  341   92 : 8171
    TOTAL  :   322  217  229  268  354  367  443  504  757 1686 1148  386  257  413  389  341   92 : 8173
           ...............................................................................................
    MEAN         0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.   0.    0.
```

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```
                    NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

          SULFUR DIOXIDE(SO2)                                          C-B SHALE OIL PROJECT
                                TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                      WIND DIRECTION
                     N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW CALM   TOTAL
CONCENTRATION
  UG/M**3
  GT   140 :                                                                                       :
130 -  140 :                                                                                       :
120 -  130 :                                                                                       :
110 -  120 :                                                                                       :
100 -  110 :                                                                                       :
 90 -  100 :                                                                                       :
 80 -   90 :                                                                                       :
 70 -   80 :                                                                                       :
 60 -   70 :                                                                                       :
 50 -   60 :                                                                                       :
 40 -   50 :                     1                                                                 :      1
 30 -   40 :     4    1    1    1                   1              1         1    1    2    5      :     18
 20 -   30 :    13    2    3    5    5    2         0    1    4    2         2    5    2    6      :     52
 10 -   20 :    10   10    8    8    8    8   12    6   12   14   21    4    1    2    2    8    1 :    135
    LT  10 :   289  203  215  251  338  349  424  494  722 1587 1064  377  250  404  380  319   88 :   7754
   TOTAL   :   316  216  227  268  351  359  436  501  735 1605 1088  381  254  412  386  338   89 :   7960
            ...........................................................................................
   MEAN         3.   2.   1.   2.   1.   1.   0.   0.   0.   0.   1.   0.   0.   0.   0.   2.   0.      1.
```

```
                    NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

       TOTAL HYDROCARBONS                                                    C-B SHALE OIL PROJECT
                            TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                       WIND DIRECTION
               N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW CALM   TOTAL
CONCENTRATION
  UG/M**3                                                                                       :
  GT   4000 :
                                                                                                :
3600 -  4000 :
                                                                                                :
3400 -  3600 :
                                                                                                :
3200 -  3400 :
                                                                                                :
3000 -  3200 :
                                                                    1                           :    1
2800 -  3000 :
                                                                    0                           :    0
2600 -  2800 :
                                                                    0                           :    0
2400 -  2600 :
                                                                    0                           :    0
2200 -  2400 :
                                                                    0                   1       :    2
2000 -  2200 :  1
                                                                    0                   0       :    1
1800 -  2000 :  1
                                                                    0              1    0       :    3
1600 -  1800 :  0          2
    LT  1600 : 220  166  172  174  229  251  310  371  515 1197  845  285  175  301  252  216   62 : 5741
    TOTAL    : 222  166  174  174  229  251  310  371  515 1197  845  286  175  301  253  217   62 : 5748
             ..........................................................................................

MEAN/100      12.  12.  11.  11.  11.  11.  11.  11.  11.  11.  11.  12.  12.  11.  12.  12.  11.  11.
```

RADIAN
CORPORATION

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                          NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

           ETHANE(CH4)                                                           C-B SHALE OIL PROJECT
                                      TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                                  WIND DIRECTION
                       N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW CALM  TOTAL
 CONCENTRATION
   UG/M**3
    GT  2400 :                                                                                                          :
 2200 -  2400 :                                                                                                         :
 2000 -  2200 :                                                                                                         :
 1800 -  2000 :                                                                                                         :
 1600 -  1800 :                                                                                                         :
 1400 -  1600 :      1                                                                                          1        :      2
 1200 -  1400 :      1           1                                   1                                   2    1        :      6
 1000 -  1200 :      7    10     7     2     2           4     9     6    12    14     8     4     2     1    5     8 :    101
  800 -  1000 :    236   161   190   185   262   253   317   401   625  1573  1072   314   177   302   266   230    76 :   6640
  600 -   800 :      0     0     0     0     0     0     0     0     0     0     1     0     0     0     0    0     0 :      1
  400 -   600 :      0     0     0     0     0     0     0     0     0     0     0     0     0     0     0    1     0 :      1
  200 -   400 :      0     0     0     0     0     0     0     0     0     0     0     0     0     0     0    0     0 :      0
     LT  200 :      0     0     0     0     0     0     0     0     0     0     0     0     0     0     0    0     0 :      0

    TOTAL    :    245   171   198   187   264   253   321   410   632  1585  1087   322   181   304   269   238    84 :   6751
             ..............................................................................................................

    MEAN       [illegible]  904.  897.  887.  890.  884.  890.  892.  890.  891.  892.  891.  861.  872.  880.  897.  920.  890.
```

```
                         NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

   NON-METHANE HYDROCARBONS                                                    C-B SHALE OIL PROJECT
                          TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                           WIND DIRECTION
                   N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW CALM   TOTAL
 CONCENTRATION
   UG/M**3
    GT  3000 :                                                                                     :

2800 -  3000 :                                                                                     :

2600 -  2800 :                                                                                     :

2400 -  2600 :                                                                                     :

2200 -  2400 :                                                                                     :

2000 -  2200 :                                                                                     :

1800 -  2000 :                                                                1                    :     1

1600 -  1800 :                                                                0                    :     0

1400 -  1600 :                                                                0                    :     0

1200 -  1400 :                                                                0                    :     0

1000 -  1200 :                                                                0                    :     0

 800 -  1000 :                                                                0                    :     0

 600 -   800 :     1                                                1    3    2                    :     7

      LT  600 :   212  154  173  159  224  238  297  358  495 1127  806  262  165  288  243  213   61 : 5475

     TOTAL    :   213  154  173  159  224  238  297  358  495 1128  809  265  165  288  243  213   61 : 5483
              ..........................................................................................

      MEAN       275. 266. 254. 243. 244. 250. 244. 244. 237. 233. 236. 274. 270. 275. 273. 279. 226. 249.
```

```
                       NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

              CARBON MONOXIDE (CO)                                          C-B SHALE OIL PROJECT
                                   TRAILER NO. -  23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                                 WIND DIRECTION
                        N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW  CALM   TOTAL
  CONCENTRATION
    UG/M**3
    GT  4250 :                                              1                                         1                     :    2

3750 -  4000 :                                              0                                         0                     :    0

3500 -  3750 :               1                              0                                         0                     :    1

3250 -  3500 :               0                              0                                         0                     :    0

3000 -  3250 :          1    0                              0                                         0                     :    1

2750 -  3000 :          0    0                              0                                         0                     :    0

2500 -  2750 :          0    0                              0                                         0                     :    0

2250 -  2500 :          0    0                              0                                         0                     :    0

2000 -  2250 :          0    0                              0                                         0                     :    0

1750 -  2000 :          0    0                              0                                         0     1               :    1

1500 -  1750 :          0    0                              0                                         0     0               :    0

1250 -  1500 :          0    0                              0                                         0     0               :    0

     LT  1250 :       198   158   166   174   290   279   361   420   514  1156   819   284   215   337   301   229    75 : 5956

      TOTAL   :       199   159   166   174   290   279   361   421   514  1156   819   284   215   338   301   230    75 : 5961
              ....................................................................................................................

        MEAN       290.  300.  274.  271.  272.  271.  271.  287.  272.  276.  274.  272.  266.  282.  262.  272.  272.  275.
```

NUMBER OF FIVE MINUTE SAMPLES BY WIND DIRECTION AND LEVEL

NO2-F(DS)

C-B SHALE OIL PROJECT

TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

CONCENTRATION UG/M**3	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	CALM	TOTAL
GT 240 :																	:	
220 - 240 :																	:	
200 - 220 :																	:	
180 - 200 :																	:	
160 - 180 :																	:	
140 - 160 :									3	14	43	25		1			:	86
120 - 140 :	42	18	6	4	5		7	12	50	184	110	40	28	52	44	49	2 :	653
100 - 120 :	44	31	25	16	26	29	33	65	199	501	270	75	32	19	28	64	21 :	1478
80 - 100 :	142	107	145	145	182	195	250	286	354	732	545	187	140	242	197	155	35 :	4039
60 - 80 :	86	62	62	104	149	141	155	141	149	357	215	72	58	91	115	71	37 :	2065
40 - 60 :	12	6	5	6	6	5	5	6	6	18	23	3	3	9	9	5	6 :	133
20 - 40 :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 :	0
LT 20 :	0	0	2	0	0	0	0	0	1	0	1	0	0	0	0	0	4 :	8
TOTAL :	326	221	245	275	368	370	450	510	762	1806	1207	402	261	414	393	344	105 :	8462
MEAN	91.	89.	87.	83.	83.	85.	85.	88.	94.	95.	96.	97.	92.	90.	89.	94.	81.	91.

TABLE VIII
DIURNAL VARIATION OF VARIOUS RECORDED PARAMETERS

RADIAN
CORPORATION

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                       DIURNAL VARIATION OF NITROGEN OXIDES(UG/M**3)
                        TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                             HOUR
       1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  MEAN
DAY

  1    *   *   *   *:  *   *   *   *   *               :  *:                                            0
  2                    :                               :   :  *   *   *   *   *   *   *   *   *   *     0
  3    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  4    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  5    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  6    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  7    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  8    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  9    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 10    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 11    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 12    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 13    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     1
 14    *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 15    *   *   *   *:  *   *   *   *   *   *                                                            0
 16                :
 17                :
 18                :
 19                :
 20                :                       :   :
 21                :
 22                :
 23                :
 24                :                       :   *   *  19   *   *   9   *   *   *   *   *   *   *     2
 25    *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 26    *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 27    *   *   *   *   *   *   *   *   *   *   *   *   *   *  10   *   *   *   *   *   *   *   *   *     1
 28                                        *:  *:  *   *   *   *  23  12   *   *   *   *   *   *   *     3
 29    *   *   *   *   *   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 30    *   *   *   *               :   *:  *   *   *   *   *   *   *   *   *                            1
MEAN   0   0   0   0   0   0   0   0   0   0   0   0   0   1   0   1   1   1   0   0   0   0   0   0

                 TOTAL NUMBER OF OBSERVATIONS =   5562.     MEAN =        0.

           * DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

           : INDICATES CALIBRATION DURING THE HOUR
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RADIAN CORPORATION

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                   DIURNAL VARIATION OF NITRIC OXIDE(UG/M**3)
                  TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                           HOUR
       1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24 MEAN
DAY

   1   *   *   *  *:   *   *   *   *   *               :  *:   *   *   *   *   *   *   *   *   *   *    0
   2   *   *   *  *:   *   *   *   *   *   *   *   *   :   :   *   *   *   *   *   *   *   *   *   *    0
   3   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   4   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   5   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   6   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   7   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   8   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
   9   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  10   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  11   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  12   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  13   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    1
  14   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  15   *   *   *  *:   *   *   *   *   *   *                                                          0
  16               :
  17               :
  18               :
  19               :
  20               :                           :   :
  21               :
  22           *   :                                                                                  0
  23               :
  24               :                           :   *   *  11   *   *   *   *   *   *   *   *   *   *    0
  25   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  26   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  27   *   *   *   *   *   *   *   *   *   *   *   *   *   *  10   *   *   *   *   *   *   *   *   *    1
  28                                      *:  *:   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  29   *   *   *   *   *   *   *   *  *:   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *    0
  30   *   *   *   *               :  *:   *   *   *   *   *   *   *   *   *                            1
MEAN   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0

                   TOTAL NUMBER OF OBSERVATIONS =   5633.    MEAN  =      0.

           * DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

           : INDICATES CALIBRATION DURING THE HOUR
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                    DIURNAL VARIATION OF NITROGEN DIOXIDE(UG/M**3)
                     TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                           HOUR
      1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24 MEAN
DAY

  1   *   *   *   *:  *   *   *   *   *               :  *:                                            0
  2               :                                   :   :  *   *   *   *   *   *   *   *   *   *     0
  3   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  4   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  5   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  6   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  7   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  8   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
  9   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 10   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 11   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 12   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 13   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 14   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 15   *   *   *   *:  *   *   *   *   *   *                                                            0
 16               :
 17               :
 18               :
 19               :
 20               :                           :   :
 21               :
 22               :
 23               :
 24               :                           :  *   *   *   *   *   9   *   *   *   *   *   *   *     1
 25   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 26   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 27   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 28                                       *:  *:  *   *   *   *  23  12   *   *   *   *   *   *   *     3
 29   *   *   *   *   *   *   *   *   *:  *   *   *   *   *   *   *   *   *   *   *   *   *   *   *     0
 30   *   *   *   *               :  *:  *   *   *   *   *   *   *   *   *                              0
MEAN  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   1   1   0   0   0   0   0   0   0

                    TOTAL NUMBER OF OBSERVATIONS =   5362.     MEAN  =        0.

            * DENOTES A VALID SAMPLE BELOW THE MINIMUM DETECTABLE LIMIT OF THE INSTRUMENT

            : INDICATES CALIBRATION DURING THE HOUR
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RADIAN
CORPORATION

DIURNAL VARIATION OF SULFUR DIOXIDE(UG/M**3)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	0	0	0	0:	0	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	2:	2	2	2	2	1	1	2	1	2	2	2	1	0	2	2	1	2	2	2	2	1
4	3	3	2	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0:	0	0	0	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0:	0	0	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0:	0	0	0	0	:	2:	0	0	0	0	0	0	0	0	0	2	3	3	3	3	0
11	3	3	4	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16				:																					
17	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0:	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0:	0	0	0	0	0	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	1	0	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0:	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0:	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0:	0:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MEAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

TOTAL NUMBER OF OBSERVATIONS = 8165. MEAN = 0.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN
CORPORATION

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                    DIURNAL VARIATION OF SULFUR DIOXIDE(UG/M**3)
                      TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                         HOUR
       1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24  MEAN
DAY

 1     3    3    3    0:   0    0    0    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
 2     0    0    0    0:   0    0    0    0    0    1    1    1    1    1    0    0    0    0    0    0    0    0    0    0     0
 3     0    0    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
 4     0    0    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
 5     0    0    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
 6     0    0    0    0:   0    0    0    0    0    0    0    0    0    0    1    1    0    0    1    0    0    0    0    0     0
 7     0    0    0    0:   0    0    0    0    0    0    7:   6    4    5    5    5    5    4    5    5    4    5    5    6     3
 8     5    7    6    0:   0    0    0    1    6    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0     1
 9     0    0    0    0:   0    0    0    0    0    0    1    3    1    2    2    2    1    1    1    2    2    3    3    3     1
10     3    4    5    0:   0    0    0    0     :    :                                                                         1
11                    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
12     0    0    0    2:   0    0    1    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
13     0    0    0    0:   0    0    1    2    0    0    0    0    0    0    0    0    0    0    0    0    0    0    2    1     0
14     3    2    3    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
15     0    0    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
16                     :
17     0    0    0    2:   2    2    3    3    3    2    2    2    0    0    0    0    0    0    0    0    0    0    0    0     1
18     0    0    0    3:   1    1    2    2    1    0    0    1    0    0    0    0    0    0    0    0    0    1    2    2     0
19     2    2    4    0:   1    7   18   26   29   12    3    0    0    0    0    0    0    0    0    0    0    0    0    0     4
20     0    0    0    2:   5    2    2    2    2    1    0    2    2    2    3    3    3    3    2    3    3    4    5    5     2
21     5    5    6    5:   7    9    8    5    5    5    3    2    1    0    2    2    3    2    1    1    3    5    6    7     4
22     8    9   10    2:   4    6   10   11   12    0    0         0    0    0    0    0    0    0    0    0    0    0    0     3
23     0    0    0    0:   1   10   19   24   32   24   10    4    1    0    0    0    0    0    0    0    0    0    0    0     5
24     0    0    1    7:  10    9    6    3    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     1
25     0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
26     0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
27     0    0    0    0    0    0    0    0    3    0    0:   0    0    0    0    0    0    0    0    0    0    0    0    0     0
28     0    0    1    0    0    0    0    0    0    0:   0:   0    0    0    0    0    0    0    0    0    0    0    0    0     0
29     0    0    0    0    0    0    0    0    0:   0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
30     0    0    0    0    0    0    1    0:   0:   0    0    0    0    0    0    0    0    0    0    0    0    0    0    0     0
 MEAN    1    1    1    0    1    1    2    3    3    1    1    0    0    0    0    0    0    0    0    0    0    0    0    1

                     TOTAL NUMBER OF OBSERVATIONS =   7952.    MEAN  =       1.

          : INDICATES CALIBRATION DURING THE HOUR
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RADIAN
CORPORATION

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                       DIURNAL VARIATION OF TOTAL HYDROCARBONS(UG/M**3 X 10**-1)
                        TRAILER NO. - 23   PERIOD( 6/ 1/77 TO  6/30/77)

                                                HOUR
          1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24 MEAN
DAY

  1     131 140 135    :128 139 144 146    :103 110 112    :108 117 120 122 123 117 115 127 120 111 119   123
  2     122 121 122    :121 121 122 124 125 124 124 123 118:   :   :100 100  99 106 101 106 102 105 112   115
  3     113 112 112    :109 110 114 115 114 108 102 107 106 110 113 115 115 115 116 112 114 111 115 112   112
  4     114 114 113    :112 113 115 115 118 120 121 122 120 121 121 119 119 117 113 111 112 110 111 111   116
  5     109 111 111    :111 113 115 116 117 118 120 119 119 119 118 119 118 117 116 115 112 111 112 112   115
  6     112 112 111    :112 113 115 116 115 105 108 111 113 126 126 122 120 118 115 114 114 113 114 113   115
  7     113 114 113    :112 112 114 118 118 119 108 108 111 112 114 116 118 118 115 115 114 113 113 112   114
  8     112 112 112    :110 111 113 112 107 112 111 113 112 113 124 116 115 115 116 114 112 112 113 110   113
  9     108 108 108    :109 109 110 113 114 107  97 102 104 106 106  98 101 103 105 104 103 104 104 103   106
 10     103 106 125    :105 105 107 109    :  98:103 105 107 109 106 105 106 108 110 107 106 106 105 106   107
 11     105 105 105    :104 106 109 112 114 113 113 111 110 110 110 105 100 105 107 107 105 105 105 105   107
 12     105 105 105    :105 106 107 111 114 115 115 113 112 113 113 112 113 113 110 111 109 108 107 107   110
 13     107 107 107    :106 107 110 112 114 114 111 113 112 112 104:101 106 106 110 111 111 110 109 109   109
 14     105 105 105    :105 108 110 113 113 113 112 111 109 106 105 106 108 109 108 107 105 104 103 103   108
 15     103 104 103    :104 104 107 109 109  98    :137 147 105 116 122 125 137 133 137 136 140 144 129   120
 16                    :
 17                    :
 18                    :
 19                    :
 20                    :                               :  98:103 105 107 108 109 110 110 110 108 108 110 109   108
 21     108 109 109    :104 103 106 108 106 118 118 114 114 115 115 114 114 113 116 117 114 111 110 107   112
 22     106 106 106    :102 100 103 105 116 127 110     106 113 116 120 122 123 125 127 126 124 124 124   115
 23     123 122 121    :117 112 108 111 113 122 125 124 127:123:122         117                           119
 24                    :                   :   :   :       :   :   :
 25
 26
 27                                        :   :   :   101 107                                           104
 28                                            :   :116 119 120 120 119 119 119 119 119 119 119 118 118   119
 29     120 119 118 118 116 117 116 121 120 120 121 122 123 121 117 117 118 118 118 118 118 137 131 131   121
 30     151 144 132 122 120 119 120 122:122:119 118 117 116 116 115 113 113 113 113 114 114 113 113 116   120
MEAN    113 113 113 120 110 111 113 116 115 114 113 114 114 113 115 113 113 114 114 114 113 113 113 113

                   TOTAL NUMBER OF OBSERVATIONS =    5569.     MEAN  =     114.

          : INDICATES CALIBRATION DURING THE HOUR
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RADIAN
CORPORATION

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                        DIURNAL VARIATION OF METHANE(UG/M**3 X 10**-1)
                        TRAILER NO. - 23   PERIOD( 6/ 1/77 TO  6/30/77)

                                                    HOUR
        1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24  MEAN
DAY

   1  116  117  117      :116  116  115  115      : 94   95   96      : 97                                                    109
   2                     :                                            :    :    : 87   87   87   87   87   87   87   87   87     87
   3   87   88   85      : 87   87   87   88   88   88   87   88   87   88   88   88   89   88   88   88   88   88   88   88     88
   4   88   88   88      : 87   87   88   88   88   88   89   90   89   88   89   89   88   88   88   88   88   88   88   88     88
   5   88   87   87      : 87   88   88   89   89   88   89   90   89   90   89   90   90   89   89   89   89   89   88   88     89
   6   88   88   88      : 88   88   88   89   89   90   90   90   90   89   89   89   89   89   89   89   89   88   89   88     89
   7   88   89   85      : 88   88   88   89   89   89   90   90   89   89   89   89   89   90   90   89   88   89   88   88     89
   8   87   88   89      : 89   89   89   88   86   88   89   90   89   90   98   90   89   89   89   90   89   89   89   89     89
   9   89   89   89      : 89   89   89   90   90   90   89   89   88   88   88   88   88   88   88   88   87   87   87   87     88
  10   87   88   87      : 88   88   88   88      : 89 : 89   89   89   89   87   87   87   87   88   87   87   87   87   87     88
  11   87   87   87      : 86   86   87   87   87   87   87   87   87   87   87   87   87   87   87   87   86   86   87   87     87
  12   86   87   87      : 86   86   87   87   87   87   87   87   87   88   88   88   88   88   88   87   87   87   87   87     87
  13   87   87   87      : 87   87   87   87   87   87   87   87   88   88   87 : 86   87   87   87   88   88   88   87   87     87
  14   87   85   85      : 86   86   85   86   86   86   85   86   86   85   85   85   85   85   86   85   84   84   84   84     85
  15   84   81   84      : 85   85   84   84   84   85      : 87   87   86   86   86   86   86   86   86   86   88   89   88     86
  16   89   89   89      : 90   90   89   91   92   91   91   91   91   90   92   91   92   92   92   92   92   92   92   92     91
  17   92   93   93      : 93   92   92   92   93   92   92   92   92   91   90   91   91   91   90   90   91   91   91   91     92
  18   91   92   92      : 91   91   91   91   92   92   92   92   92   92   93   93   93   93   92   93   92   92   92   92     92
  19   93   92   92      : 90   87   85   83   84   88   90   91   91   91   90   91   91   91   91   91   91   91   91   91     90
  20   91   91   91      : 92   92   91   91   92   92   92 : 89 : 89   89   89   89   89   88   88   89   89   89   90   89     90
  21   89   91   90      : 88   87   88   91   93   97   95   91   89   89   89   88   88   88   90   91   91   89   89   88     90
  22   87   87   85      : 87   85   85   85   90   96   94        90   91   92   93   93   94   94   96   95   95   95   94     91
  23   95   95   95      : 92   90   87   87   86   90   92   92   93 : 97 : 97             97                                     92
  24                     :                        :    :    :         :    :    :
  25
  26
  27                                              :    : 87 : 83   82   81                                                     83
  28                                                   :    : 84   84   84   84   84   83   83   84   83   83   83   83   83     83
  29   84   84   84   83   84   84   84   84   85   84   84   84   83   84   84   84   83   84   83   84   83   95   95   91     85
  30  109  103   94   85   88   83   83   84 : 86 : 84   82   83   83   83   82   82   83   83   83   83   82   82   82   83     85
MEAN   90   90   90   84   89   89   89   89   88   89   89   88   88   89   89   88   88   88   88   88   88   88   88   88

                        TOTAL NUMBER OF OBSERVATIONS =    6557.     MEAN  =      89.

            : INDICATES CALIBRATION DURING THE HOUR
        DIURNAL VARIATION OF NON-METHANE HYDROCARBONS(UG/M**3 X 10**-1)
                 TRAILER NO. - 25  PERIOD( 6/ 1/77 TO  6/30/77)

                                                         HOUR
         1    2    3    4    5    6    7    8    9   10   11   12   13   14   15   16   17   18   19   20   21   22   23   24  MEAN
 DAY

   1    15   23   16     :  12   23   28   31     :   8   14   16     :  11                                                      19
   2                     :                                        :    :    :  12   13   13   19   15   19   15   18   26       17
   3    26   26   26     :  22   22   26   27   26   20   15   19   18   22   25   27   26   27   28   24   26   24   26   24    24
   4    26   26   25     :  25   26   27   28   30   32   33   32   32   33   32   31   30   29   25   23   24   22   23   23    28
   5    22   24   23     :  24   24   27   27   28   30   31   30   30   30   29   29   28   27   27   25   23   23   23   24    26
   6    24   23   23     :  24   25   26   27   26   15   18   21   24   36   37   33   31   29   26   25   25   25   25   25    26
   7    25   25   25     :  23   23   26   29   29   29   19   16   21   23   25   27   29   28   26   25   25   24   24   24    25
   8    23   24   23     :  22   22   24   24   22   24   21   23   23   23   27   26   26   25   26   24   23   22   24   20    24
   9    20   19   20     :  20   19   21   23   24   18    9   13   16   17   18   10   13   15   17   17   15   17   17   16    17
  10    16   16   36     :  18   18   19   21     :   9:  14   16   19   20   19   18   19   21   22   20   19   19   19   19    19
  11    16   16   18     :  18   19   22   25   27   26   25   24   23   23   23   18   14   18   20   20   19   19   18   19    21
  12    19   19   16     :  19   19   21   24   27   28   27   26   25   25   26   24   25   25   22   23   21   21   20   20    23
  13    20   20   20     :  19   20   23   26   27   26   24   25   24   24   17:  15   19   21   22   23   22   22   22   22    22
  14    21   20   20     :  19   23   25   27   27   27   27   25   23   21   18   21   22   23   22   22   21   20   19   20    22
  15    19   20   19     :  19   20   23   25   25   13     :  50   60   19   29   35   39   51   47   51   50   52   55   41    35
  16                     :
  17                     :
  18                     :
  19                     :
  20                     :                                  :   9:  14   17   19   20   21   21   22   21   20   19   20   20    19
  21    20   19   19     :  17   17   19   17   15   21   23   23   25   26   26   26   26   25   26   26   23   21   21   20    22
  22    19   19   18     :  15   15   16   20   25   31   16        16   21   25   26   28   29   31   31   31   30   29   29    24
  23    28   27   26     :  24   22   21   24   27   32   33   32   33:  26:  25             20                                  27
  24                     :                        :    :    :         :    :    :
  25
  26
  27                                              :    :    :        19   25                                                   23
  28                                                   :    :  32   34   35   36   36   36   35   35   36   35   36   35   35    35
  29    35   35   34   34   34   33   34   37   35   35   37   38   39   36   32   33   35   34   35   35   35   41   36   40    35
  30    42   41   38   36   36   36   37   38:  37:  35   35   34   34   33   32   31   30   30   29   30   31   31   31   33    34
MEAN    23   23   24   35   22   22   24   26   27   24   23   26   26   25   20   25   25   26   26   26   25   25   25   25

                  TOTAL NUMBER OF OBSERVATIONS =    5310.    MEAN =     25.

        : INDICATES CALIBRATION DURING THE HOUR
```

DIURNAL VARIATION OF CARBON MONOXIDE(UG/M**3 X 10**-1)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1									91	34	36	35	:	35	35	36									40
2				:									:	:	:	24	26	28	29	30	31	31	31	32	29
3	31	31	31	:	31	30	31	32	30	30	30	29	29	29	30	30	29	29	29	30	30	29	30	29	30
4	24	30	30	:	30	29	29	30	29	29	29	30	30	29	29	28	28	28	27	27	27	27	27	26	29
5	27	27	27	:	28	28	29	29	29	29	28	28	28	28	27	30	31	29	28	30	29	28	29	28	29
6	26	27	28	:	28	28	29	28	29	28	28	27	27	27	27	27	27	26	26	27	26	26	26	26	27
7	26	26	25	:	25	25	25	26	25	26	28	28	29	28	29	29	29	28	29	28	28	28	28	27	27
8	29	29	28	:	26	26	27	26	25	26	27	29	28	27	27	27	27	26	26	26	26	26	26	26	27
9	25	25	25	:	26	27	27	28	27	26	25	25	25	25	25	24	24	24	24	25	24	24	24	26	25
10	71	24	70	:	25	26	26	20	:	38:															38
11				:																					
12				:																					
13				:											:										
14				:																					
15				:							:	28	27	27	27	27	27	26	26	27	26	27	27	27	27
16	27	27	27	:	28	29	27	28	30	29	31	30	29	29	29	29	29	29	30	30	29	29	30	29	29
17	30	29	29	:	30	30	30	30	30	30	29	29	28	26	26	27	26	26	26	26	26	26	27	27	28
18	27	27	27	:	27	27	26	27	29	29	29	29	30	28	28	27	28	28	27	29	27	27	26	26	28
19	26	26	27	:						25	29	30	30	29	29	28	28	27	27	27	27	26	25	26	27
20	26	25	26	:	24	24	23	26	26	25	25:	:	25	26	25	25	25	25	25	26	24	25	24	25	25
21	24	25	25	:	22	20	23	25	23	24	25	25	25	25	25	25	26	25	25	26	25	24	24	23	24
22	23	23	22	:									27	29	29	29	28	29	30	29	30	30	27	27	27
23	26	26	25	:									25:	26:	26	27	26	26	26	26	26	26	26	26	26
24	26	26	26	:	25	25	26		:	:	:		:	:	:	24	24	24	23	24	24	23	23	23	24
25	23	23	23	24	23	23	24	24	23	23	23	23	22	22	22	23	23	23	22	23	22	22	22	22	23
26																									
27	20	21	22	21	21	21	22	22	22:	:	41:	24	24	23	23	23	23	23	23	23	24	24	24	23	23
28	23	23	23	22	22	23	23	22		:	:	29	27	28	28	28	27	28	28	28	27	27	28	29	26
29	29	29	29	30	30	29	29	30	30	28	29	29	28	28	27	27	26	27	26	28	29	29	28	27	28
30	27	27	27	26	27	26	27	27:	51:	24	23	24	24	23	23	23	23	23	23	23	23	23	23	23	25
MEAN	29	26	28	25	26	26	27	27	30	28	28	28	27	27	27	27	27	26	26	27	27	26	26	26	

TOTAL NUMBER OF OBSERVATIONS = 5853. MEAN = 27.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF OZONE(UG/M**3)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	77	80	76	80:	79	79	71	65	79:	85	91	91	90	88	87	87	91	95	84	81	73	77	75	72	81
2	68	66	64	75:	68	68	62	68	82	84	83	82	84	85:	89	88	87	88	86	83	83	78	78	78	78
3	75	73	67	66:	67	65	71	82	84	85	85	86	89	90	92	93	93	94	96	82	80	79	78	79	82
4	82	80	77	74:	76	72	68	81	87	88	93	96	95	96	95	93	95	90	90	91	88	84	84	82	86
5	79	76	76	60:	79	79	78	82	92	96	109	101	101	99	99	104	102	97	96	94	86	80	75	65	88
6	60	73	74	86:	80	84	70	74	96	91	94	93	94	94	87	88	89	88	83	79	77	73	74	65	81
7	69	73	67	62:	60	68	65	76	87	89	88	90	90	90	95	96	95	91	89	85	79	83	84	80	82
8	76	71	75	72:	76	71	74	91	93	92	91	94	88	91	97	97	96	97	102	98	90	79	89	91	87
9	78	69	73	65:	68	79	83	97	103	103	99	96	99	97	96	95	95	92	90	86	74	76	82	78	88
10	75	72	69	65:	74	74	65	79	:	96:	94	96	98	95	92	93	92	94	95	92	80	77	73	78	84
11	76	80	81	61:	81	81	73	87	96	94	93	91	92	93	91	90	89	90	94	85	73	76	78	84	85
12	89	89	89	97:	92	88	82	88	94	110	109	105	106	113	115	116	113	111	110	101	92	93	95	94	99
13	95	96	96	96:	92	95	81	94	106	109	113	103	105	104	105	105	104	109	119	118	114	119	115	110	104
14	104	109	106	105:	107	104	93	109	116	118	121	110	104	90	88	98	103	102	95	86	76	75	77	77	99
15	85	75	81	84:	85	79	74	75	95	90	84	81	76	76	79	81	83	84	82	79	70	74	76	77	80
16	79	78	79	81:	85	86	66	84	91	97	98	98	107	114	117	117	121	122	118	110	106	107	104	110	99
17	107	111	109	107:	106	101	96	111	112	118	121	112	107	90	78	89	89	80	76	75	73	82	91	95	97
18	91	82	75	91:	102	97	85	89	121	129	135	135	137	140	144	147	144	139	137	127	114	120	120	118	118
19	106	105	102	88:	81	70	69	71	84	132	142	135	128	118	112	113	113	113	106	111	108	100	94	90	104
20	79	85	88	96:	97	98	103	110	125	129	129	129	137	136	136	137	139	138	139	139	129	129	115	113	119
21	107	107	103	107:	106	98	100	117	116	123	130	133	132	132	136	128	120	122	126	125	119	118	106	103	117
22	100	99	99	87:	104	99	85	88	107	122	128		132	132	136	136	136	136	135	123	106	103	109	112	114
23	105	103	102	103:	103	94	80	86	94	107	119	123	122	120	118	116	117	115	109	111	107	104	101	98	107
24	95	98	95	91:	73	92	89	96	99	102	103	93	86	84	96	95	93	86	87	84	86	83	86	86	91
25	83	82	78	76	79	79	77	83	94	95	97	99	99	100	94	83	89	99	114	108	97	94	92	90	91
26	73	83	83	87	63	84	82	87	91	98	86	85	83	82	82	81	78	74	74	77	72	65	65	63	80
27	65	60	62	64	60	65	66	76	77	82	81:	83	90	92	90	91	92	91	89	88	82	77	79	78	78
28	67	65	66	55	49	52	54	50	61	78	79	78	74	73	66	68	68	66	68	68	61	59	61	67	64
29	65	67	65	66	68	63	65	64	76:	78:	81	82	80	85	84	87	84	85	84	86	86	85	86	84	77
30	79	75	73	74	72	71	65	66:	76:	76	78	76	76	67	64	62	58	62	66	65	60	60	63	67	69
MEAN	80	75	72	81	83	81	76	84	94	100	101	99	100	99	99	99	99	98	98	95	88	87	87	86	

TOTAL NUMBER OF OBSERVATIONS = 8454. MEAN = 91.

: INDICATES CALIBRATION DURING THE HOUR

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                        HOURLY TOTAL PRECIPITATION(HUNDREDTHS OF INCHES)
                         TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                   HOUR
       1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  TOTAL
DAY

  1    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  2    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  3    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  4    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  5    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  6    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  7    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  8    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
  9    0   0   0   0   0   0   0   0   0  16   0   0   0   0   0   0   0   0   0   0   0   0   0   0    16
 10    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 11    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 12    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 13    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 14    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 15    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 16    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 17    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 18    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 19    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 20    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 21    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 22    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 23    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 24    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 25    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 26    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 27    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 28    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 29    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
 30    0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0     0
TOTAL  0   0   0   0   0   0   0   0   0  16   0   0   0   0   0   0   0   0   0   0   0   0   0   0

              TOTAL NUMBER OF OBSERVATIONS =    8610.    TOTAL =      16.

   : INDICATES CALIBRATION DURING THE HOUR
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DIURNAL VARIATION OF WIND SPEED AT 8 FEET(MPH)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	1	1	1	0	1	0	0	1	3	3	2	7	6	5	4	2	5	4	4	3	4	2	2	2	3
2	2	3	2	3	2	1	2	2	9	8	8	9	12	10	11	9	12	1	5	10	6	4	2	2	6
3	5	3	4	3	4	3	3	9	10	9	9	10	9	7	8	8	6	4	5	3	4	2	3	3	6
4	3	1	2	2	2	2	2	1	1	3	4	5	5	4	6	4	3	13	12	9	10	3	2	2	4
5	3	2	1	1	1	2	4	5	4	4	4	5	7	6	5	3	5	7	9	11	5	3	2	2	4
6	2	1	1	1	2	3	2	2	3	5	8	8	7	5	10	7	5	8	6	4	3	1	1	2	4
7	0	1	1	2	2	2	1	3	6	6	3	1	6	6	4	4	10	7	4	4	3	5	4	2	4
8	3	3	3	2	2	2	2	3	2	3	4	7	6	3	4	3	6	2	5	3	2	1	8	4	3
9	2	1	2	3	5	1	4	8	12	11	13	10	14	13	11	13	13	11	10	6	3	4	3	1	7
10	1	1	2	1	2	1	1	2	7	11	13	12	13	13	13	12	10	10	12	5	2	3	1	1	6
11	2	1	1	0	1	0	1	5	9	10	12	13	12	12	12	9	7	9	9	5	3	4	2	2	6
12	1	2	1	3	2	2	1	2	3	8	10	9	10	9	12	10	8	8	7	3	4	1	1	2	5
13	2	2	2	2	0	1	1	3	9	9	11	12	10	10	10	11	13	11	6	5	4	4	3	2	6
14	2	2	1	2	1	1	2	6	9	9	14	16	11	14	14	13	11	12	9	6	3	3	2	4	7
15	2	3	3	1	0	1	1	1	2	9	10	12	13	15	15	12	13	11	7	5	3	4	3	2	6
16	2	1	3	1	1	0	1	1	2	5	10	9	12	13	13	12	13	13	10	8	7	4	3	1	6
17	2	2	2	1	0	0	1	0	1	4	8	11	11	13	11	11	11	10	10	6	3	6	8	8	6
18	3	2	4	1	2	2	3	2	8	10	13	12	12	14	14	14	11	11	7	4	3	3	2	1	7
19	3	1	3	2	2	1	0	2	2	9	12	10	10	12	12	12	12	9	14	9	5	5	5	4	7
20	3	3	4	6	4	1	4	9	12	13	14	14	13	13	11	10	12	12	9	6	4	3	3	3	8
21	2	1	2	2	1	1	0	1	2	4	5	5	3	6	5	6	8	6	9	7	2	3	3	2	4
22	3	3	1	1	1	0	1	1	2	2	3		6	7	5	4	6	2	3	4	3	3	2	1	3
23	1	2	0	2	1	0	0	1	1	1	4	6	6	6	5	5	8	7	8	12	7	4	1	2	4
24	3	2	1	1	2	1	3	2	4	4	6	8	8	8	11	5	6	6	7	2	4	3	2	2	4
25	2	3	3	3	3	3	3	2	3	4	6	6	6	5	8	9	5	10	12	7	3	8	7	8	5
26	11	1	1	2	2	2	2	2	3	5	8	6	7	7	8	5	8	6	10	8	4	3	2	2	5
27	2	1	2	2	1	1	1	1	2	5	6	6	7	9	11	10	9	9	8	8	6	3	3	1	5
28	2	1	0	2	1	0	0	0	2	3	5	4	4	7	8	8	10	7	7	6	2	2	1	1	3
29	2	2	2	2	2	1	0	1	2	2	4	4	7	13	11	9	10	11	9	11	5	4	7	1	5
30	1	2	3	2	2	2	1	2	3	4	5	5	6	10	11	10	10	10	8	6	3	3	1	1	5
MEAN	2	2	2	2	2	1	2	3	5	6	8	8	9	9	9	8	9	8	8	6	4	3	3	2	

TOTAL NUMBER OF OBSERVATIONS = 683. MEAN = 6.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND SPEED AT 30 FEET(MPH)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	1	1	2	2	2	1	1	2	5	5	3	9	8	6	6	3	6	6	6	5	7	4	4	4	4
2	3	5	4	4	3	2	2	3	11	10	11	12	16	12	14	12	16	2	6	14	9	6	3	4	8
3	8	8	7	5	6	6	4	12	13	11	11	12	11	9	10	10	8	5	7	6	7	3	5	5	8
4	6	3	3	4	3	3	3	3	2	5	5	7	7	5	8	5	4	18	16	13	13	4	3	4	6
5	5	5	2	2	1	3	6	6	5	5	5	7	9	9	7	4	7	10	13	15	7	6	3	3	6
6	3	2	2	1	2	7	3	3	5	7	10	10	9	7	14	9	7	13	9	7	6	4	3	3	6
7	1	2	2	4	4	3	2	4	8	8	5	2	8	8	6	6	13	10	7	7	5	8	7	4	6
8	6	5	5	5	4	4	4	5	4	5	6	10	9	5	5	4	8	4	7	6	3	3	11	7	5
9	3	4	3	5	8	4	6	11	16	15	16	13	18	17	15	18	16	14	13	10	7	7	6	2	10
10	3	2	3	2	4	2	2	4	9	14	17	15	17	16	16	16	13	13	16	7	5	6	3	2	9
11	2	2	1	1	3	2	3	8	12	13	16	17	16	15	15	13	10	12	12	8	6	7	3	3	8
12	2	4	2	5	4	4	2	3	5	10	13	12	13	12	16	13	11	10	10	6	7	3	2	3	7
13	4	3	4	4	2	3	2	5	11	12	15	15	13	13	13	15	17	15	9	8	9	9	7	5	9
14	4	4	3	5	3	2	4	8	12	12	18	20	15	18	17	17	15	16	12	10	7	7	5	7	10
15	5	4	4	2	1	1	1	2	4	12	13	16	17	20	19	16	17	15	10	7	7	7	5	4	9
16	4	2	4	2	2	0	2	2	3	5	13	11	15	17	16	15	17	17	14	11	10	8	5	2	8
17	4	2	2	1	0	1	2	1	2	5	10	14	13	16	14	14	15	14	14	9	6	10	13	12	8
18	5	4	6	3	5	5	4	3	10	12	16	15	15	18	18	18	14	13	10	6	6	7	4	2	9
19	5	6	6	5	2	2	1	4	4	12	16	13	13	15	15	15	16	12	18	12	9	9	8	7	10
20	4	4	7	10	6	4	7	12	16	17	18	19	16	17	14	13	15	16	13	8	6	5	5	6	11
21	4	2	4	3	2	3	1	2	4	5	7	7	5	8	7	9	12	8	14	11	5	6	6	3	6
22	3	4	3	2	3	3	3	3	5	4	5		8	10	7	6	8	4	5	7	4	5	4	0	5
23	2	3	1	4	3	1	1	3	3	3	6	8	7	8	7	7	11	9	11	16	10	7	3	4	6
24	5	4	2	2	4	3	4	4	5	6	8	11	10	11	15	6	9	9	9	3	7	6	4	4	6
25	4	6	5	5	5	5	4	3	5	5	7	7	8	7	11	12	7	14	17	9	5	12	11	11	8
26	15	6	4	3	3	4	3	3	4	7	9	8	8	9	10	7	10	8	14	11	7	5	3	4	7
27	3	3	3	2	3	3	1	1	3	7	8	7	9	12	14	13	12	12	12	11	10	7	6	3	7
28	4	1	1	3	2	1	1	1	3	3	5	6	5	9	10	11	13	10	10	9	4	3	2	3	5
29	4	[illegible]	3	3	3	3	1	1	3	3	5	6	9	17	14	12	13	15	12	15	9	7	11	4	7
30	2	3	3	5	3	4	2	2	4	5	6	6	8	12	15	13	14	13	11	8	5	4	2	2	6
MEAN	4	4	3	3	3	3	3	4	7	8	10	11	11	12	12	11	12	11	11	9	7	6	5	4	

TOTAL NUMBER OF OBSERVATIONS = 8603. MEAN = 8.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN CORPORATION

DIURNAL VARIATION OF WIND SPEED AT 100 FEET(MPH)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

HOUR

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	1	1	2	3	2	1	1	2	5	5	4	10	9	7	6	4	7	7	8	5	8	5	4	4	5
2	4	5	4	6	3	2	1	3	13	11	12	13	17	14	16	14	18	3	8	18	13	7	4	5	9
3	10	11	8	6	7	6	5	14	14	13	12	14	12	10	12	12	9	6	8	10	12	3	5	7	10
4	9	4	3	5	5	5	4	3	2	5	5	8	8	6	9	6	5	21	19	16	17	5	4	5	7
5	6	4	1	2	0	4	8	7	5	5	5	8	10	10	8	5	8	12	16	19	10	9	4	3	7
6	3	1	1	2	1	10	5	5	6	7	11	12	10	7	15	11	8	15	11	9	8	6	5	3	7
7	1	2	2	3	4	4	4	4	9	8	6	3	9	9	6	7	14	11	9	9	7	12	10	6	7
8	9	8	7	7	5	5	4	5	5	5	6	11	11	5	6	4	8	4	9	8	5	3	14	10	7
9	4	1	5	7	10	6	6	13	18	16	18	15	20	19	17	20	19	16	16	13	11	11	8	4	12
10	4	4	3	2	4	4	2	4	10	16	19	17	19	19	19	17	15	15	18	10	8	10	3	2	10
11	2	1	2	1	2	3	2	9	13	15	17	19	18	17	17	14	12	13	15	11	11	12	3	2	10
12	2	4	4	4	4	5	2	3	5	11	14	13	14	14	18	15	13	11	11	10	12	4	1	3	8
13	4	3	5	4	2	2	3	6	12	13	17	17	14	14	14	16	19	17	10	12	14	15	12	10	11
14	10	7	5	3	7	3	4	9	13	14	20	23	16	21	20	19	17	18	15	12	12	12	11	13	13
15	11	6	2	3	1	1	1	2	4	13	14	19	20	22	22	19	20	17	12	10	13	11	9	4	11
16	6	4	5	1	0	0	1	2	4	6	14	13	17	20	18	18	20	19	17	16	16	14	8	2	10
17	3	2	0	1	0	1	3	1	3	6	11	15	15	18	17	16	17	16	17	12	11	15	18	18	10
18	7	6	8	5	10	8	4	3	12	14	18	17	17	20	20	21	16	16	12	9	11	12	9	5	12
19	8	6	6	6	2	1	2	4	5	14	18	14	14	17	17	17	18	14	21	15	13	11	11	9	11
20	4	5	11	14	8	6	9	13	18	19	20	22	18	20	15	15	17	18	15	10	9	9	5	5	13
21	4	3	4	2	3	4	2	2	4	6	7	8	6	9	7	8	14	10	16	13	7	8	10	3	7
22	1	3	3	3	3	3	3	3	5	5	5		9	11	8	7	9	5	6	9	5	5	4	0	5
23	2	3	1	3	4	1	1	2	4	3	6	8	8	8	8	6	13	11	12	19	13	10	4	6	7
24	8	5	1	3	5	5	5	4	5	6	8	12	11	12	16	7	10	11	13	4	10	7	6	6	8
25	5	8	5	7	8	6	5	3	5	6	7	8	9	7	12	16	8	17	19	11	6	15	13	14	9
26	18	7	3	5	5	4	3	3	4	8	10	8	9	10	11	7	11	9	17	13	9	8	3	4	8
27	6	3	2	2	3	2	2	1	3	8	9	6	10	13	16	15	14	13	13	13	13	9	9	4	8
28	5	3	2	0	3	1	0	1	4	3	6	6	5	11	11	12	14	11	11	11	5	4	2	2	5
29	4	5	2	2	4	2	1	1	3	4	5	0	10	19	16	13	15	16	14	17	12	10	15	7	8
30	3	2	2	6	4	3	2	3	5	5	6	7	9	13	16	14	15	15	12	11	6	6	3	1	7
MEAN	5	4	4	4	4	4	3	5	7	9	11	12	13	13	14	12	13	13	13	12	10	9	7	6	

TOTAL NUMBER OF OBSERVATIONS = 8604. MEAN = 9.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN
CORPORATION

DIURNAL VARIATION OF WIND SPEED AT 200 FEET(MPH)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
	HOUR																								
1	1	3	1	3	1	1	1	2	5	5	3	10	10	7	6	4	8	7	10	5	8	7	5	4	5
2	3	5	1	4	7	5	2	3	13	12	12	13	18	15	17	15	19	3	9	21	15	8	4	5	10
3	9	12	9	6	7	7	8	10	15	14	12	15	13	11	12	13	10	6	9	12	15	7	3	6	10
4	11	5	3	3	5	3	3	3	2	5	5	7	8	6	9	6	5	23	21	18	21	6	4	5	8
5	7	4	2	2	1	7	10	7	5	6	5	6	10	10	8	5	9	13	18	22	11	10	5	2	8
6	5	1	1	2	2	12	7	7	7	8	11	12	10	8	16	10	8	16	12	11	11	7	5	2	8
7	1	2	3	3	3	3	6	5	9	9	6	3	11	9	6	7	15	12	10	10	9	14	12	7	7
8	11	11	9	8	5	5	4	5	4	5	6	11	12	5	6	4	9	4	10	11	6	3	16	12	8
9	5	5	6	9	13	6	8	14	20	17	19	16	21	20	18	22	20	17	17	15	13	14	10	5	14
10	4	5	3	3	3	5	2	5	10	17	20	18	20	20	20	18	16	16	19	12	10	10	3	2	11
11	2	1	2	1	1	4	1	10	14	15	18	20	19	18	18	15	12	14	16	13	13	12	3	1	10
12	1	4	6	4	4	4	1	2	4	11	15	14	15	14	19	15	14	12	13	11	13	5	1	2	9
13	3	2	6	3	6	1	4	6	13	14	17	17	15	14	15	17	20	19	11	15	16	16	16	15	11
14	15	4	5	2	12	10	6	10	14	14	22	24	17	22	21	20	18	19	16	14	15	15	14	17	15
15	16	2	1	4	2	2	1	1	4	13	15	20	21	24	24	20	21	19	13	12	15	11	12	6	12
16	6	6	5	1	0	0	0	1	4	6	15	13	16	21	19	19	21	21	20	19	21	19	11	3	11
17	3	1	2	0	0	1	2	1	3	6	12	16	16	19	17	17	18	17	19	15	14	20	23	23	11
18	9	7	7	7	12	12	5	3	13	15	19	18	18	21	22	23	18	17	13	10	12	13	13	10	13
19	8	5	7	4	1	1	1	2	4	14	18	15	14	18	18	18	19	15	22	17	14	11	12	12	11
20	6	3	14	18	8	8	10	14	19	20	22	23	19	21	16	17	19	20	17	13	10	10	6	3	14
21	3	3	5	2	4	5	1	2	4	6	7	8	6	9	7	9	14	10	17	13	8	9	13	4	7
22	1	3	3	2	3	3	1	3	5	4	4		9	11	7	7	8	4	6	10	7	5	3	1	5
23	0	2	1	2	4	1	0	1	3	2	6	8	8	8	8	8	13	11	13	21	14	13	5	6	7
24	10	6	3	3	3	4	4	3	5	6	6	12	12	13	17	7	11	12	17	4	10	8	8	8	8
25	6	6	5	0	0	4	4	2	5	6	8	8	9	6	13	20	10	19	22	12	6	18	16	17	10
26	21	11	3	2	4	2	2	3	4	6	11	9	9	10	11	7	11	10	18	13	11	9	2	2	8
27	7	6	3	2	2	2	3	1	3	6	9	8	10	13	15	15	14	14	13	12	14	10	12	5	8
28	6	4	3	0	1	1	1	1	3	3	5	6	5	11	11	11	13	11	11	11	8	5	2	3	6
29	3	4	1	2	3	0	2	1	3	3	5	5	11	19	17	13	16	17	14	16	12	12	17	8	8
30	3	1	1	5	5	2	1	2	4	5	6	7	9	13	15	14	15	14	12	12	7	10	4	2	7
MEAN	6	5	4	4	4	4	3	5	7	9	12	13	13	14	14	13	14	14	15	13	12	11	9	7	

TOTAL NUMBER OF OBSERVATIONS = 8603. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION AT 8 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	192	181	180	190	209	193	180	48	29	321	283	76	328	244	242	296	296	291	23	182	229	238	219	165	230
2	226	185	105	175	50	155	74	330	212	201	214	209	208	214	228	265	305	297	216	215	224	157	163	176	204
3	189	187	108	117	125	97	69	198	202	212	223	211	221	223	242	242	229	219	242	223	228	5	85	100	192
4	145	104	190	213	208	121	117	146	354	30	95	36	23	341	10	91	41	127	160	150	186	77	130	160	112
5	175	197	224	233	148	183	135	128	144	150	153	107	117	106	79	38	147	146	182	197	158	149	218	225	158
6	211	193	219	167	201	160	205	101	147	185	162	179	232	133	167	162	64	78	56	139	164	135	138	213	164
7	218	190	211	226	103	169	196	161	205	216	250	207	204	194	217	249	296	356	93	128	116	92	133	221	190
8	141	185	118	197	96	111	99	214	214	247	150	298	304	16	43	320	340	258	218	225	153	92	226	201	172
9	150	151	120	154	156	101	165	191	207	208	214	210	211	202	215	210	213	219	226	212	208	262	337	203	196
10	195	213	195	121	167	191	167	250	224	218	205	207	216	217	221	204	222	214	229	210	209	224	46	234	205
11	130	231	189	346	170	193	81	191	206	215	206	197	201	211	218	234	235	233	244	253	221	227	277	186	211
12	178	179	110	177	245	201	60	52	7	208	200	194	263	230	245	228	235	240	228	209	226	63	98	231	201
13	140	165	168	207	121	135	136	111	199	203	214	187	199	188	211	219	226	226	216	203	211	215	211	211	190
14	258	195	148	112	56	10	43	175	209	206	205	208	208	223	216	219	227	218	228	224	217	221	213	210	204
15	211	195	216	200	197	190	69	21	58	207	208	207	231	227	228	232	250	247	244	235	218	225	235	155	214
16	215	208	212	225	216	157	48	102	52	175	214	212	219	214	224	211	218	222	214	211	211	213	238	94	203
17	206	197	228	169	152	78	94	167	341	265	215	192	209	208	217	227	217	226	224	230	203	196	204	206	204
18	187	296	215	196	212	234	324	325	234	205	225	226	211	233	235	223	240	256	242	230	221	216	189	285	231
19	208	227	211	215	201	255	198	1	5	199	201	207	185	199	205	188	204	210	183	180	184	172	170	162	201
20	91	182	131	205	344	193	214	208	209	199	203	203	226	227	215	214	214	232	253	243	223	214	219	232	212
21	231	212	221	159	178	98	214	251	349	352	5	298	228	325	329	192	205	212	341	350	6	38	289	244	268
22	224	250	22	207	192	155	57	24	340	318	355		257	329	325	320	310	318	310	345	239	233	211	213	278
23	315	251	187	252	212	71	93	59	301	350	340	330	349	10	25	13	196	189	157	261	150	197	145	145	243
24	158	217	320	61	146	141	92	74	352	308	322	337	355	21	145	181	29	192	197	159	176	163	119	114	125
25	103	124	97	116	146	125	66	90	325	328	316	321	318	252	228	209	220	350	330	261	197	176	181	181	193
26	213	222	71	167	150	149	105	78	266	323	349	317	347	336	337	20	326	337	330	315	268	222	161	221	317
27	215	40	71	93	114	120	210	242	65	333	345	262	292	295	304	292	288	277	303	310	322	319	306	109	304
28	121	153	153	227	215	208	120	20	19	40	331	360	347	347	13	314	310	330	325	303	240	225	191	214	294
29	170	172	221	227	157	222	166	76	49	58	3	304	274	294	261	280	283	294	294	311	308	351	334	348	285
30	220	210	221	210	219	225	16	340	18	17	326	306	350	307	317	300	305	325	323	323	242	230	223	150	287
MEAN	168	180	168	179	167	157	116	167	301	238	238	233	244	250	242	240	252	247	243	228	211	199	194	191	

TOTAL NUMBER OF OBSERVATIONS = 8603. MEAN = 208.

: INDICATES CALIBRATION DURING THE HOUR

CORPORATION

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                    DIURNAL VARIATION OF WIND DIRECTION AT  30 FEET
                    TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                  HOUR
         1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24 MEAN
DAY

   1   285 174 216 134 213 200 226  23  22 314 282  71 321 236 236 287 290 275  11 171 220 237 212 150    242
   2   197 176 164 175  69 159  75 320 208 210 209 202 199 217 224 259 296 283 212 213 222 148 161 167    199
   3   171 170 108 108 112  92 117 193 197 208 216 204 218 219 230 235 225 215 237 212 208  16  80  95    182
   4   140 112 168 182 175 117 109 161   9  25  71  54  24 325   1  86  35 119 154 142 178  91 103 140    106
   5   154 161 246 248 105 164 127 120 137 146 142 112 128 110  80  25 127 141 177 192 152 139 215 233    149
   6   194 180 216 282 196 155 193 122 146 187 156 173 213 117 159 155  57  75  55 134 158 118 126 201    158
   7   168 171 165 226  97 158 210 206 203 210 259 219 200 169 213 244 289 348  86 121 110  90 123 215    187
   8   151 157 114 102  94 104  90 209 210 255 135 287 297 360  39 306 330 272 214 220 160  84 222 196    171
   9   157 152 167 133 150  95 156 184 200 199 209 205 204 198 210 204 208 214 220 211 201 250 327 203    192
  10   167 173 245 102 149 186 174 245 217 211 198 201 210 212 215 199 216 210 224 210 197 201  35 212    199
  11   166 231 117 332 142 154  81 189 201 210 200 191 196 205 211 227 228 227 237 229 206 207 325 165    198
  12   162 209 218 161 234 208  59  56 358 261 194 188 197 224 257 223 230 232 223 200 206  61  87 227    204
  13   122 168 151 191  47 130 132 106 195 199 208 180 193 182 206 219 221 221 213 201 197 197 191 188    182
  14   199 148 218 109 185 349  35 167 204 260 199 202 201 217 211 214 221 213 222 221 201 202 192 196    201
  15   194 147 192 179 156 152  58  25  33 207 203 203 223 221 223 227 244 240 238 226 199 200 216 209    202
  16   216 220 210 224 222 156  60  97  44 150 206 209 214 214 220 207 213 216 210 206 205 204 235  80    199
  17   187 157 226 158 105  18  63 141 353 242 212 194 203 203 210 221 213 221 220 227 196 192 200 202    196
  18   166 311 211 189 194 214 311 315 228 205 220 222 207 226 228 220 234 247 235 219 195 195 181 252    222
  19   275 216 202 212 208 236 202 354   7 195 194 201 179 193 199 184 200 209 177 184 175 160 159 159    197
  20    91  86 164 199 328 183 211 203 204 194 197 200 219 221 210 209 213 226 246 238 205 192 220 222    206
  21   213 202 209 141 166  91 207 256 343 347 369 291 226 327 309 177 205 214 334 344 357  27 296 240    265
  22   212 222 216 207 228 145  52  18 328 305 357     253 322 325 311 302 311 303 341 245 224 204 184    272
  23   328 257 227 237 200  16  80  30 310 349 334 321 351   5  17   8 191 184 150 256 145 191 150 133    294
  24   144 169 311  69 133 132  90  66 351 295 315 330 347  14 138 190 102 187 190 146 169 162 136 126    132
  25   100 118  83 107 131 115  80  67 335 328 309 316 304 287 232 205 218 343 330 257 189 171 174 175    186
  26   267 187  73 104 119 145 101  71 271 316 343 312 325 326 330 356 317 325 322 306 264 218 138 208    309
  27   195  96  72  91 112 113 211 247  74 327 338 255 265 284 297 285 282 272 295 301 316 317 308  18    301
  28   169 120 165 214 195 334  93 347  16  33 325 355 345 336   5 308 300 321 318 295 241 215 202 211    312
  29   162 151 201 212 159 222 184  56  51  48 352 301 265 256 255 275 274 267 287 302 300 339 326 342    279
  30   311 181 191 177 179 213 342 335  10  13 316 288 328 298 309 291 299 317 314 315 239 238 241 125    286
MEAN   174 173 169 167 155 148 115 104 310 233 236 227 236 245 236 236 243 242 238 223 201 184 187 185

                 TOTAL NUMBER OF OBSERVATIONS =    8605.     MEAN  =     203.

          : INDICATES CALIBRATION DURING THE HOUR
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DIURNAL VARIATION OF WIND DIRECTION AT 100 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	331	75	235	358	153	177	145	49	25	319	299	75	334	235	240	295	296	282	13	157	218	269	243	158	275
2	173	191	173	189	188	155	110	293	210	211	210	203	200	216	225	259	299	282	211	214	225	154	148	148	201
3	157	162	127	116	116	122	151	193	197	208	217	208	213	215	231	235	225	217	237	212	205	214	74	113	185
4	141	126	127	157	168	122	115	148	343	19	67	44	36	337	13	86	38	123	153	141	174	113	96	110	103
5	126	158	134	259	79	138	123	120	142	152	147	107	106	115	99	28	111	146	180	192	153	129	141	224	136
6	156	219	266	306	88	147	136	140	146	177	156	173	222	115	158	152	61	78	60	134	160	115	110	189	142
7	163	115	130	231	100	148	191	193	207	212	242	208	200	189	215	247	291	352	88	125	115	94	120	211	175
8	133	159	133	117	112	119	99	209	200	232	137	286	297	14	42	320	333	239	215	217	175	103	223	209	174
9	158	137	193	153	147	101	152	184	200	198	298	206	203	197	209	204	208	212	219	211	202	249	325	357	193
10	135	142	199	211	121	171	182	244	217	211	198	201	210	212	216	199	217	211	223	210	196	200	27	328	199
11	152	307	159	310	112	151	104	209	201	209	199	191	195	204	210	227	225	228	238	232	207	208	1	140	198
12	155	226	279	159	254	229	74	58	357	202	194	187	190	223	235	223	229	233	224	203	209	180	90	242	207
13	46	136	129	165	29	140	135	113	195	197	207	184	192	186	210	218	219	221	212	202	191	192	193	189	179
14	191	176	233	101	177	176	115	164	203	201	198	201	200	218	212	212	222	212	220	224	200	199	192	193	195
15	191	249	208	202	149	151	95	31	44	210	203	203	223	220	223	226	244	239	239	233	200	197	196	225	207
16	226	237	234	265	272	112	78	89	51	313	209	210	214	215	220	207	213	217	210	209	209	205	236	99	210
17	229	125	133	297	31	31	101	31	352	243	213	192	202	204	213	223	214	221	220	230	200	195	202	206	206
18	197	333	222	197	198	262	286	315	232	207	220	223	209	227	228	220	233	248	237	223	196	190	190	187	221
19	347	213	219	226	55	304	194	10	18	190	193	200	183	192	195	184	199	209	176	185	175	150	147	171	190
20	156	78	116	195	216	191	212	202	205	194	198	199	221	222	205	210	215	225	247	243	215	210	275	241	209
21	238	227	235	155	128	61	185	268	350	351	1	295	242	322	327	211	195	206	337	350	1	27	310	320	293
22	222	258	246	246	219	178	73	16	333	301	334		257	324	330	312	306	316	310	348	288	255	229	143	286
23	329	273	293	271	228	193	115	29	332	320	350	326	354	1	26	7	192	165	146	261	147	185	167	121	286
24	127	152	146	166	111	116	93	65	351	300	320	335	352	17	140	185	127	185	190	155	167	157	168	151	133
25	118	127	165	105	116	116	91	100	323	331	307	305	320	295	229	204	226	346	335	267	187	171	174	180	186
26	215	228	97	111	110	102	106	76	285	320	350	318	342	335	327	357	319	330	328	311	273	234	110	216	321
27	211	[illegible]	111	96	110	121	242	251	73	333	340	282	291	294	302	289	287	275	300	306	321	327	326	24	297
28	42	76	73	318	217	267	67	355	13	36	324	331	346	337	5	309	302	323	319	300	271	233	249	232	324
29	161	123	172	114	106	288	226	66	52	45	353	299	265	288	257	279	276	289	292	306	305	340	329	349	294
30	335	151	152	149	146	146	308	342	10	16	310	307	342	302	311	295	303	318	317	320	267	266	302	54	314
MEAN	168	165	175	177	138	149	127	94	315	244	235	229	236	245	234	238	243	240	238	225	205	192	187	181	

TOTAL NUMBER OF OBSERVATIONS = 6605. MEAN = 203.

: INDICATES CALIBRATION DURING THE HOUR

CORPORATION

DIURNAL VARIATION OF WIND DIRECTION AT 200 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	36	125	146	343	34	165	136	73	33	325	308	77	333	257	260	303	301	286	14	148	221	292	275	214	312
2	184	213	208	217	215	195	188	240	220	221	220	212	209	228	234	265	303	284	219	222	231	191	157	165	216
3	168	170	159	135	135	169	176	201	204	217	226	217	228	225	242	243	234	226	244	227	222	205	119	139	198
4	143	157	113	156	179	133	119	158	334	34	58	43	33	356	10	92	40	123	159	147	176	156	111	116	111
5	114	152	152	236	351	124	122	129	155	161	151	121	114	126	93	49	134	150	190	200	163	120	119	183	139
6	127	351	281	9	119	148	156	151	158	190	105	181	227	146	166	159	66	79	62	136	167	130	120	213	146
7	149	109	136	212	127	158	197	192	216	222	264	217	211	197	224	257	299	354	88	126	124	100	125	213	180
8	144	152	150	139	141	151	128	218	214	257	149	291	301	17	43	330	337	258	223	222	200	129	233	226	197
9	166	159	210	174	155	122	163	193	207	206	217	217	211	206	219	213	217	219	227	220	220	263	329	347	206
10	167	124	156	267	121	155	202	247	226	219	207	209	220	221	225	208	226	220	232	219	213	223	246	215	208
11	231	349	268	302	95	135	191	205	210	217	209	200	203	211	218	237	235	239	246	242	226	235	265	126	222
12	198	220	285	188	202	265	162	67	355	211	204	196	200	237	244	232	238	242	231	215	228	221	212	281	226
13	77	169	127	166	27	103	141	130	205	207	216	193	201	196	214	226	226	230	221	214	207	207	211	207	190
14	207	192	236	168	191	190	197	177	212	209	207	209	209	227	221	221	231	219	228	234	218	220	217	214	209
15	214	288	256	230	209	212	166	54	14	221	211	212	232	229	232	237	254	247	248	240	212	211	197	233	228
16	208	260	255	278	266	204	198	119	60	190	219	224	223	223	226	216	221	224	216	217	217	216	251	205	223
17	285	77	113	110	221	68	102	35	345	264	219	201	210	212	221	232	222	229	226	239	215	210	214	217	211
18	218	335	236	215	215	205	255	207	230	216	226	231	218	234	257	228	241	256	244	232	214	202	204	203	229
19	321	257	252	255	15	88	190	16	37	206	202	212	193	200	204	193	207	215	184	195	190	163	159	192	200
20	194	54	197	201	206	201	218	208	214	203	204	207	231	226	213	219	223	232	255	253	236	230	333	282	222
21	281	256	260	196	142	90	147	200	359	354	4	303	251	326	328	222	212	224	342	356	7	28	324	355	306
22	41	279	278	270	253	259	121	23	350	315	332		263	331	336	324	310	323	315	353	313	283	255	214	306
23	8	240	259	311	250	234	222	344	345	351	358	333	346	359	30	6	200	192	154	265	154	186	177	130	297
24	115	151	166	132	127	128	116	76	360	307	325	338	357	19	145	196	331	187	198	177	179	165	185	177	150
25	153	151	142	126	129	135	116	124	337	323	311	320	322	299	240	212	240	349	338	276	201	177	183	191	209
26	219	220	150	126	121	158	116	81	299	325	351	329	338	335	338	352	328	330	328	313	278	244	92	248	314
27	200	216	217	121	127	296	249	258	76	339	349	271	293	297	305	292	292	289	303	308	325	337	338	29	296
28	72	60	58	43	253	262	212	292	11	22	325	360	357	354	4	309	306	326	322	304	292	255	284	274	326
29	295	98	122	259	73	340	250	193	80	35	352	300	202	251	201	282	280	293	295	309	308	339	330	354	307
30	350	116	144	158	134	145	311	337	11	15	334	305	350	305	312	298	307	321	319	323	293	261	316	2	326
MEAN	176	173	192	152	159	164	172	166	310	250	247	238	247	255	245	246	257	249	246	234	220	210	216	211	

TOTAL NUMBER OF OBSERVATIONS = 6665. MEAN = 221.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN CORPORATION

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 8 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	5	9	17	7	8	7	15	20	17	19	27	19	19	32	24	21	18	20	9	9	9	14	7	7	15
2	11	12	18	10	19	8	10	20	14	25	16	18	15	26	27	13	11	22	9	10	13	11	16	18	15
3	6	9	12	7	7	12	33	11	11	14	17	15	20	24	19	18	14	15	12	6	4	10	10	7	13
4	13	15	13	8	19	11	12	24	44	31	29	35	19	28	18	15	16	14	9	10	7	12	7	6	17
5	8	11	10	7	7	7	10	13	25	26	31	28	26	22	32	28	15	16	12	9	10	8	11	11	16
6	5	12	7	10	6	7	10	13	24	22	13	11	19	23	11	16	25	13	10	7	7	7	7	5	12
7	12	10	10	9	9	10	15	24	17	24	27	22	8	12	16	20	15	10	10	10	14	13	11	10	14
8	12	10	8	9	9	9	17	15	27	22	26	13	9	17	21	34	12	25	13	13	11	12	9	8	15
9	12	6	11	10	9	14	11	11	11	13	12	15	12	13	16	13	12	13	10	10	7	8	9	6	11
10	8	7	9	8	8	13	12	19	15	14	14	15	13	14.	13	12	14	14	10	6	6	5	9	8	11
11	5	11	8	16	7	14	11	26	12	14	15	13	16	17	13	14	19	14	12	6	5	5	11	7	12
12	11	8	13	7	8	8	13	20	20	19	16	17	24	17	15	15	12	15	10	5	4	17	13	15	14
13	5	9	6	6	12	7	14	17	14	18	14	12	19	20	16	16	11	10	10	4	3	5	5	6	11
14	10	8	16	11	22	11	20	14	12	13	13	13	17	9	13	16	13	11	12	5	5	4	8	6	12
15	5	9	3	11	8	9	10	10	30	25	15	14	13	13	11	14	13	13	13	8	7	7	14	15	12
16	11	11	11	6	5	9	8	23	25	25	17	22	15	13	13	15	12	12	11	7	7	6	9	18	13
17	14	6	6	9	16	11	12	25	29	33	18	18	11	16	20	17	13	13	11	10	6	8	9	8	14
18	15	25	7	12	7	6	6	20	21	21	14	15	14	13	13	11	15	11	9	8	6	9	10	15	13
19	6	3	5	6	5	7	15	16	28	15	15	18	18	16	13	17	13	15	11	8	8	7	7	5	11
20	12	17	12	10	10	14	9	13	12	12	11	13	16	13	16	16	14	12	10	9	6	9	8	5	12
21	4	5	8	7	13	10	17	26	20	18	17	15	23	34	21	23	12	15	10	10	11	8	9	7	14
22	5	8	5	6	8	10	13	22	30	29	29		25	14	21	34	14	20	19	7	4	3	7	5	15
23	12	9	5	7	7	15	7	18	36	35	27	30	25	28	23	25	14	15	12	10	13	10	15	9	17
24	4	12	5	11	7	6	11	22	20	22	22	16	19	18	12	24	16	16	9	18	9	10	10	10	14
25	8	7	6	8	8	8	11	22	28	31	27	19	22	32	15	6	13	7	6	12	9	6	8	12	14
26	12	17	14	11	7	7	13	24	34	20	18	22	30	15	23	26	19	14	8	9	10	6	9	7	16
27	13	10	22	13	8	13	20	32	35	20	19	21	20	18	14	13	14	15	10	11	6	13	10	13	16
28	9	9	10	6	10	9	10	22	20	27	27	28	26	20	13	17	15	15	13	9	7	7	9	7	14
29	10	7	6	7	12	12	10	23	34	25	24	25	23	13	16	21	17	12	13	10	8	7	10	9	15
30	22	9	6	9	8	10	20	21	22	26	33	34	23	16	16	18	16	14	13	10	7	8	9	7	16
MEAN	9	10	10	9	10	10	13	20	23	22	20	19	19	19	17	18	15	14	11	9	8	9	10	9	

TOTAL NUMBER OF OBSERVATIONS = 8573. MEAN = 14.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 30 FEET
TRAILER NO. = 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	3	6	13	6	7	9	11	15	12	15	21	16	14	26	26	11	14	18	5	5	6	10	2	3	12
2	3	4	12	10	16	8	9	20	10	14	12	12	13	18	16	8	3	17	6	4	9	9	16	10	11
3	5	4	9	5	4	9	39	9	5	12	12	17	17	16	11	12	11	13	8	5	3	15	8	4	11
4	12	9	11	5	12	6	8	18	36	20	25	24	21	24	17	12	13	9	5	4	2	8	3	7	13
5	4	4	4	5	7	5	6	9	19	24	27	28	24	22	29	21	12	12	7	6	6	5	7	9	13
6	4	7	10	10	6	4	6	14	23	21	6	8	21	17	4	11	18	8	7	5	6	6	6	3	10
7	9	8	9	7	6	6	11	15	13	19	28	24	7	11	9	14	9	5	6	5	9	7	7	6	10
8	8	5	6	6	7	5	12	14	22	19	24	10	6	10	15	21	8	10	10	7	8	8	5	10	11
9	9	3	7	7	5	9	6	9	9	9	8	12	9	10	10	9	7	9	8	5	2	5	6	6	7
10	3	3	10	5	3	10	9	16	11	10	10	13	10	11	9	9	11	11	7	5	2	3	7	10	8
11	8	7	2	7	5	9	8	22	9	11	10	11	13	14	11	10	14	11	8	5	5	3	16	7	9
12	7	6	13	4	9	4	8	13	13	14	10	16	22	14	10	12	11	10	8	3	3	19	12	9	10
13	2	7	4	6	8	5	8	12	9	14	10	11	15	15	12	18	10	8	7	2	4	4	4	5	8
14	5	4	14	6	18	25	17	10	8	10	9	10	14	10	12	11	10	8	7	4	3	6	6	5	10
15	6	7	3	6	9	7	8	15	17	13	11	12	10	10	9	10	8	8	9	3	3	1	14	9	9
16	10	10	8	4	2	7	5	21	23	33	14	19	10	10	10	10	10	8	8	5	3	2	6	13	10
17	7	3	8	8	9	4	9	20	16	39	15	15	11	11	15	13	10	10	6	5	4	2	3	4	10
18	15	14	4	9	6	5	9	13	16	12	10	10	11	11	10	7	12	8	6	4	5	4	8	9	9
19	5	4	5	8	13	5	10	12	28	11	12	15	13	13	11	12	10	10	8	5	2	4	2	5	9
20	9	11	12	7	9	6	5	9	9	10	10	10	14	10	14	13	9	9	9	4	4	7	11	2	9
21	2	4	4	4	5	7	12	26	16	19	14	10	24	14	18	20	8	14	6	6	6	4	6	8	11
22	3	6	3	6	6	7	9	14	26	21	32		14	11	17	28	11	14	13	5	3	2	4	6	11
23	5	14	5	4	3	8	3	15	32	28	25	20	30	23	23	13	8	11	9	9	8	4	14	6	13
24	5	10	17	5	2	3	7	15	23	14	17	9	14	12	7	17	15	12	5	15	6	7	8	7	10
25	3	3	3	3	4	4	5	16	18	27	24	18	20	19	8	5	8	4	6	7	7	4	6	7	10
26	7	22	13	10	4	3	9	20	26	19	13	18	30	15	20	17	14	14	5	4	4	5	4	4	12
27	5	11	16	13	4	7	11	30	29	18	16	15	13	14	11	9	10	9	6	4	4	6	5	10	11
28	5	11	11	2	5	4	7	16	18	22	23	28	24	17	11	12	12	11	10	5	6	5	7	3	11
29	7	5	3	10	10	5	5	17	30	23	17	20	18	10	13	15	12	7	5	4	5	1	6	6	11
30	12	5	4	4	9	6	11	15	14	25	28	33	20	15	10	12	13	8	9	5	6	7	6	7	12
MEAN	7	7	8	6	7	7	10	16	18	18	16	16	16	14	13	13	11	10	7	5	5	6	7	7	

TOTAL NUMBER OF OBSERVATIONS = 8578. MEAN = 11.

: INDICATES CALIBRATION DURING THE HOUR

CORPORATION

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 100 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	6	9	14	6	5	7	11	17	11	11	20	13	11	28	19	12	16	17	3	7	7	6	8	7	11
2	5	8	18	6	21	6	14	22	7	10	12	10	10	15	12	9	6	14	4	5	6	7	21	8	11
3	1	3	11	4	1	15	48	9	6	9	11	13	17	17	12	9	12	12	7	2	4	35	14	2	11
4	4	10	9	4	3	4	6	16	35	21	29	17	15	24	13	10	13	8	4	5	2	12	3	3	11
5	2	5	16	6	7	6	4	7	20	20	23	21	22	19	22	27	12	11	6	3	5	3	8	7	12
6	5	12	10	3	8	2	12	7	22	22	5	7	18	20	2	9	15	6	6	3	4	3	2	3	8
7	15	7	4	5	5	6	13	24	13	16	30	25	6	9	7	14	7	2	5	2	7	5	5	4	10
8	6	5	5	5	7	7	9	12	21	22	16	11	7	7	12	30	6	14	8	6	8	10	4	3	10
9	7	2	8	7	4	7	6	8	8	8	6	10	8	9	9	8	8	9	5	5	3	4	4	4	7
10	3	5	8	7	3	6	10	13	10	5	8	10	11	10	9	8	9	9	6	6	2	2	12	6	7
11	8	8	8	5	6	6	11	20	7	10	10	10	11	11	11	10	14	7	5	3	3	3	23	5	9
12	11	7	7	3	6	4	9	11	10	11	8	13	14	11	8	11	12	11	5	4	2	26	22	4	9
13	4	5	4	4	6	8	7	10	9	10	7	10	13	14	15	15	7	4	4	3	4	2	4	3	7
14	3	2	12	14	11	31	23	10	5	8	8	6	13	8	10	12	7	5	6	4	2	4	2	3	9
15	4	8	3	7	13	6	6	17	22	13	11	12	10	10	7	7	7	8	8	3	3	3	7	10	8
16	5	6	9	12	7	6	5	16	19	26	9	20	8	7	8	8	9	5	5	3	3	1	4	15	9
17	14	6	15	5	7	5	6	18	15	32	11	16	10	10	12	12	7	7	8	5	4	4	6	2	10
18	15	17	3	5	4	3	10	25	12	11	9	9	10	9	8	7	9	3	4	2	3	2	5	14	8
19	5	6	4	6	7	9	16	11	18	11	11	12	13	11	12	12	8	9	4	1	3	2	3	6	8
20	15	17	12	7	20	7	5	9	8	8	9	9	10	8	11	13	10	7	5	5	3	5	15	5	9
21	4	4	4	6	5	6	17	19	13	17	12	10	21	16	15	15	14	11	5	6	5	3	7	11	10
22	11	5	6	5	5	8	5	12	25	27	15		11	8	14	21	7	17	10	4	5	4	4	6	10
23	3	9	7	4	4	7	6	18	25	33	18	18	25	18	15	14	8	9	7	7	7	3	14	4	12
24	2	11	14	4	2	1	5	13	12	12	15	10	16	11	4	16	7	9	3	14	5	7	4	4	8
25	3	3	1	3	2	3	4	18	19	17	18	13	14	16	8	3	8	6	5	5	6	4	4	7	8
26	10	21	24	9	2	3	7	18	15	11	13	19	26	9	16	17	12	7	4	7	4	4	4	2	11
27	2	21	25	14	6	7	9	23	29	10	13	16	11	10	6	9	8	9	4	8	3	4	5	7	11
28	7	11	15	9	4	7	16	17	11	26	25	17	19	16	8	12	9	8	7	7	5	6	10	5	11
29	7	4	5	16	9	5	8	18	28	29	15	20	16	7	11	14	10	6	7	6	5	3	4	5	11
30	8	3	3	5	1	10	6	15	10	14	29	23	20	15	9	10	13	9	7	4	9	4	10	12	10
MEAN	6	8	9	7	6	7	10	15	16	16	14	14	14	13	11	12	10	9	6	5	4	6	8	6	

TOTAL NUMBER OF OBSERVATIONS = 8571. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF WIND DIRECTION STANDARD DEVIATION AT 200 FEET
TRAILER NO. = 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	5	3	8	3	6	8	9	24	12	14	16	13	9	18	26	15	13	22	3	7	6	6	7	5	11
2	7	6	8	5	8	7	14	29	7	8	11	9	9	13	11	8	5	21	5	3	12	7	18	6	10
3	2	2	19	8	5	15	29	6	7	9	9	12	13	15	11	11	10	13	6	3	2	17	31	9	11
4	3	10	6	3	3	3	5	17	34	16	26	17	16	15	11	11	13	6	3	4	3	18	4	1	10
5	3	5	12	7	5	3	3	8	19	18	24	21	25	18	21	28	11	10	6	1	6	2	8	12	11
6	4	5	15	5	9	2	4	5	18	15	7	6	14	16	2	8	13	6	6	4	3	4	2	4	7
7	6	8	3	5	7	7	7	21	11	15	29	21	5	10	8	12	9	5	5	3	5	6	3	15	9
8	5	5	5	6	16	9	14	11	15	16	19	7	4	9	13	25	6	16	8	3	9	14	6	4	10
9	9	2	6	5	4	6	4	6	7	8	5	10	4	7	8	7	7	7	6	3	3	2	9	3	6
10	5	3	11	5	3	3	9	13	9	9	7	7	6	8	8	8	5	11	5	4	3	5	19	9	7
11	11	10	8	2	7	4	22	17	6	8	7	7	10	12	7	7	12	7	6	6	3	1	23	15	9
12	20	9	4	7	6	3	14	13	11	12	8	13	13	14	9	8	11	10	7	2	1	21	19	9	10
13	3	9	3	8	20	7	5	10	8	9	8	11	11	11	10	14	6	5	4	4	4	1	3	3	7
14	1	3	14	21	7	7	17	9	4	8	7	9	10	7	9	10	9	5	4	2	5	4	2	2	7
15	2	10	8	3	7	5	4	22	27	10	9	9	10	5	6	9	7	4	8	4	2	2	4	10	8
16	2	5	7	9	7	6	6	23	19	22	10	14	8	5	6	7	7	5	3	2	4	3	7	12	8
17	9	4	6	13	11	3	4	21	15	30	11	14	10	8	12	10	7	6	5	4	4	3	5	6	9
18	29	15	3	5	1	3	11	23	19	6	6	6	9	8	7	5	11	5	6	5	2	2	2	2	8
19	5	3	4	2	5	5	9	26	23	9	8	12	13	10	10	9	8	10	5	4	3	4	5	3	8
20	17	28	5	4	14	6	5	10	7	8	6	8	11	6	9	11	8	4	6	4	3	2	8	12	8
21	5	4	3	7	2	3	9	18	11	11	11	11	22	14	13	18	10	14	6	6	5	4	4	2	9
22	9	7	4	5	3	5	8	12	17	21	25		11	8	11	28	7	14	8	2	5	4	5	3	9
23	7	8	4	8	6	5	2	18	23	26	22	20	12	16	15	12	7	8	7	6	5	2	8	4	10
24	1	8	11	8	1	2	5	14	10	8	14	10	11	9	4	12	9	9	2	11	3	5	2	4	7
25	5	2	5	4	4	8	3	26	14	20	18	13	14	14	11	5	9	1	8	7	4	2	2	5	9
26	12	23	33	31	6	7	8	17	27	11	10	16	24	9	12	17	7	9	4	6	7	4	7	6	13
27	3	8	42	24	18	6	6	24	26	12	10	15	12	7	10	5	9	7	5	4	5	4	3	6	11
28	8	9	9	10	9	3	5	16	13	22	21	20	31	15	6	9	8	11	6	5	5	4	10	5	11
29	25	9	11	11	8	5	3	24	28	30	11	19	17	6	8	11	9	7	5	5	6	2	5	4	11
30	9	12	6	4	6	6	7	23	11	18	33	24	20	8	7	11	10	7	5	4	7	5	5	10	11
MEAN	8	8	9	8	7	5	8	17	15	14	13	13	13	11	10	12	9	9	5	4	4	5	8	6	

TOTAL NUMBER OF OBSERVATIONS = 8575. MEAN = 10.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF HORIZONTAL WIND DIRECTION STANDARD DEVIATION AT 200 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	4	3	4	5	6	6	5	15	8	15	19	11	8	17	21	14	11	20	3	3	3	5	7	3	9
2	6	5	5	2	8	6	10	25	4	7	9	7	8	12	8	7	4	22	6	4	11	14	15	4	9
3	2	2	15	5	4	11	26	5	4	8	11	10	10	12	10	8	9	18	6	4	3	19	36	8	10
4	3	9	6	1	4	3	4	16	28	13	30	13	14	14	11	10	16	7	2	3	3	23	6	2	10
5	2	3	7	8	8	2	2	7	16	15	21	18	26	17	23	30	11	9	14	2	6	1	7	13	11
6	5	10	8	5	8	2	4	3	20	12	4	6	14	15	2	7	9	5	5	2	3	4	2	3	7
7	5	7	4	3	6	6	5	29	14	32	46	38	13	12	22	53	23	5	5	3	9	5	5	11	14
8	6	8	18	15	32	24	18	10	30	53	39	17	15	5	10	33	6	24	14	3	3	14	30	18	18
9																									
10																									
11																									
12																									
13																									
14																									
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24																									
25																									
26																									
27																									
28																									
29																									
30																									
MEAN	4	6	8	6	9	8	9	14	15	19	21	15	13	13	13	20	11	14	7	3	5	11	14	8	

TOTAL NUMBER OF OBSERVATIONS = 2274. MEAN = 11.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 6 FEET(DEG F)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9											67	69	69	70	72	74	73	71	69	66	59	57	57	54	66
10	51	49	48	46	47	49	53	58	64	60	67	69	71	72	73	74	72	72	70	67	60	56	54	53	61
11	52	51	50	50	49	51	57	64	68	69	70	72	74	74	75	75	74	73	71	68	59	56	56	55	63
12	54	51	50	50	47	46	53	59	65	70	71	73	74	75	77	76	75	75	73	66	59	59	61	57	63
13	58	56	56	55	51	54	60	68	73	75	76	77	79	79	80	81	80	78	76	70	62	59	58	58	67
14	56	56	56	54	53	55	61	69	73	75	78	79	80	82	82	81	80	79	77	72	62	59	59	57	68
15	54	53	54	55	54	51	56	66	71	74	75	77	79	80	80	80	79	78	76	71	60	58	57	58	67
16	55	55	52	51	50	52	54	61	67	73	76	76	79	79	80	80	79	78	76	71	65	62	60	61	66
17	57	57	53	53	52	52	56	64	69	75	78	79	81	82	82	82	82	80	78	73	65	65	65	65	69
18	63	53	54	55	56	54	57	62	70	73	75	75	77	79	79	79	79	77	75	69	60	58	58	56	67
19	51	48	49	46	45	45	52	57	65	73	76	77	78	80	80	79	79	79	76	72	65	63	63	62	65
20	54	57	56	57	57	56	61	65	68	70	72	73	75	73	74	74	74	73	71	67	58	55	52	50	65
21	47	46	43	47	45	44	49	57	62	66	70	70	72	74	74	74	74	72	69	65	61	59	55	52	60
22	49	47	46	45	46	47	52	51	60	60	69		73	72	75	75	76	73	74	70	63	59	58	57	61
23	54	52	53	49	50	51	54	59	64	70	73	77	77	78	80	80	77	77	74	69	65	64	62	59	65
24	57	57	55	55	55	55	60	65	70	71	75	77	78	80	76	75	70	64	65	63	60	58	58	57	65
25	56	55	54	55	55	55	60	66	72	75	77	78	79	81	76	69	73	71	71	72	68	66	66	66	67
26	64	65	62	61	59	59	65	69	72	75	77	79	80	82	82	82	83	80	78	73	70	65	64	59	71
27	60	60	61	61	62	60	66	70	76	76	77	79	80	83	83	83	83	82	81	77	74	71	67	67	72
28	64	61	60	55	52	53	57	62	67	70	73	75	78	81	82	83	83	81	79	76	70	66	66	64	69
29	62	61	55	56	54	51	54	62	68	72	75	76	79	83	83	82	82	82	80	76	70	66	65	63	69
30	60	55	51	52	51	52	55	62	66	72	75	78	80	82	83	83	83	82	80	76	69	65	66	66	69
MEAN	57	55	53	52	52	52	57	63	68	71	74	76	77	78	79	78	78	76	74	70	64	61	60	59	

TOTAL NUMBER OF OBSERVATIONS = 6176. MEAN = 67.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN CORPORATION

DIURNAL VARIATION OF TEMPERATURE AT 30 FEET(DEG F)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9											66	67	68	69	70	72	71	70	69	67	62	59	58	56	66
10	54	55	51	49	50	50	55	58	62	64	65	67	69	70	71	72	71	71	70	67	63	60	57	57	62
11	54	53	52	52	52	55	56	64	66	68	68	70	72	73	73	73	73	72	71	68	62	60	58	58	63
12	57	55	52	54	50	49	52	59	65	68	70	71	72	74	75	75	75	74	73	70	64	63	63	60	64
13	56	54	57	58	55	57	55	67	71	73	74	76	77	76	78	79	79	78	76	72	67	66	65	63	68
14	60	60	59	57	57	57	62	69	72	73	76	77	78	80	80	80	79	79	77	74	67	64	64	62	69
15	62	58	60	58	57	57	58	66	70	73	74	75	77	78	78	78	78	77	76	72	66	66	63	60	68
16	59	57	56	55	54	58	54	60	67	72	74	75	77	78	78	79	79	78	76	72	67	66	63	64	67
17	63	62	61	57	54	54	56	63	69	73	76	78	79	80	81	81	81	80	78	74	69	68	67	67	70
18	65	61	58	59	60	57	57	62	69	71	73	74	75	77	77	77	78	77	75	72	66	66	63	61	68
19	56	56	54	51	44	43	52	57	65	73	74	76	76	76	78	78	79	78	76	73	69	67	66	65	66
20	62	60	64	64	60	59	62	65	67	68	70	72	73	72	73	73	74	73	71	68	63	61	55	55	66
21	55	57	49	50	49	45	49	56	61	65	69	70	72	73	73	74	74	74	70	66	63	61	58	56	62
22	55	53	51	49	49	49	52	51	61	65	62		72	71	74	75	75	74	74	72	67	65	64	63	63
23	54	56	50	53	54	56	55	59	65	70	73	76	76	77	78	79	77	76	75	69	66	65	63	61	66
24	[illegible]	[illegible]	[illegible]	[illegible]	57	57	60	64	69	70	73	75	77	76	75	75	71	66	65	65	63	60	60	59	66
25	58	57	57	55	56	56	59	66	71	74	76	78	78	80	76	69	74	71	72	72	70	67	67	66	68
26	65	63	63	63	60	61	63	68	71	73	75	77	78	80	80	81	82	80	77	74	72	68	66	65	71
27	64	63	63	64	60	62	66	70	73	75	76	77	79	81	82	82	82	82	81	79	76	73	71	69	73
28	65	65	63	62	59	57	59	62	66	69	72	74	77	79	80	82	81	81	80	78	74	71	68	68	70
29	65	65	63	58	57	55	56	62	68	71	73	75	76	80	81	81	81	82	80	77	72	69	67	66	70
30	64	62	61	58	57	55	55	62	67	71	74	77	79	80	81	82	82	81	80	78	73	69	69	68	70
AVG	61	60	58	56	55	55	57	62	67	71	72	74	75	77	77	77	77	76	75	72	67	65	63	62	

TOTAL NUMBER OF OBSERVATIONS = 6174. MEAN = 68.

* = INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF TEMPERATURE AT 100 FEET(DEG F)
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	HOUR 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9											64	65	66	66	68	70	69	68	68	66	63	61	59	57	65
10	55	54	55	50	52	55	54	57	61	63	63	65	67	67	68	69	69	69	68	67	65	64	60	59	61
11	57	55	54	53	54	54	57	62	64	65	66	67	69	70	70	70	71	71	69	68	64	64	60	60	63
12	54	56	54	56	55	55	52	58	63	66	67	68	70	71	72	72	72	72	71	70	68	64	64	61	64
13	62	62	61	60	58	60	55	66	69	71	71	73	73	74	75	76	76	75	74	72	70	69	68	65	68
14	64	64	61	60	60	60	63	67	69	71	73	74	75	77	77	77	77	77	75	73	69	67	67	65	69
15	65	60	60	61	60	60	60	64	68	70	71	72	73	75	75	75	76	75	74	72	69	71	67	61	68
16	62	58	58	56	55	54	55	60	65	69	72	72	74	75	75	76	76	75	74	72	69	68	65	64	67
17	64	65	62	59	57	56	56	62	67	71	73	74	76	77	77	78	78	78	76	73	70	68	68	68	69
18	65	62	59	61	62	61	58	61	67	69	70	71	72	74	74	75	75	74	73	71	69	69	66	64	68
19	59	56	56	55	52	50	51	56	63	70	71	73	73	75	75	75	76	76	74	72	70	68	67	66	66
20	60	62	60	60	61	60	61	64	65	66	68	69	70	70	70	70	71	71	70	68	66	65	57	56	66
21	55	53	51	51	51	47	49	55	60	65	67	68	70	70	71	72	72	72	69	65	63	61	58	57	61
22	57	51	53	51	51	51	51	56	59	62	66		70	69	71	72	72	72	72	71	68	66	65	64	62
23	61	60	57	56	57	56	56	58	63	67	70	73	73	74	75	76	74	74	73	68	66	65	63	62	66
24	61	60	61	59	59	58	59	63	67	68	71	72	74	75	72	73	69	66	66	64	64	62	62	61	65
25	59	59	56	56	56	56	59	65	69	71	73	75	76	77	74	69	72	70	71	72	69	67	67	66	67
26	60	63	63	62	61	62	62	67	69	71	73	74	75	76	77	78	79	78	76	73	71	69	67	67	70
27	65	65	65	65	65	66	65	68	71	72	73	74	76	78	79	79	79	79	78	77	75	72	71	68	72
28	65	65	65	65	61	59	59	61	64	67	70	71	74	76	77	76	78	78	78	76	73	71	68	68	69
29	66	64	65	62	59	59	57	61	66	69	71	72	75	77	78	78	78	79	78	75	72	69	68	66	69
30	60	62	62	61	59	59	56	60	65	69	72	74	75	77	78	79	79	78	78	76	73	69	68	68	69
MEAN	62	60	59	57	57	57	57	61	66	68	70	71	72	74	74	74	74	74	73	71	68	67	65	63	

TOTAL NUMBER OF OBSERVATIONS = 6176. MEAN = 67.

: INDICATES CALIBRATION DURING THE HOUR

HOURLY TOTAL SOLAR RADIATION(LANGLEY)
(TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	TOTAL
1	0	0	0	0	0	6	21	37	52	66	4	60	43	29	53		22	26	4	0	0	0	0	0	423
2	0	0	0	0	0	5	22	35	52	65	72	78	82	71	72	31	32	17	7	0	0	0	0	0	641
3	0	0	0	0	0	4	19	32	52	66	77	89	86	82	64	53	32	19	11	0	0	0	0	0	686
4	0	0	0	0	0	6	20	36	51	65	75	81	50	88	73	20	35	15	4	1	0	0	0	0	620
5	0	0	0	0	0	5	20	36	51	65	75	69	84	76	60	24	5	4	1	0	0	0	0	0	575
6	0	0	0	0	0	4	11	19	33	39	32	56	82	29	26	55	31	11	7	1	0	0	0	0	436
7	0	0	0	0	0	4	17	35	51	66	31	17	16	26	25	37	39	12	5	0	0	0	0	0	381
8	0	0	0	0	0	3	20	34	38	49	50	20	14	28	66	34	28	16	8	1	0	0	0	0	409
9	0	0	0	0	0	2	13	23	48	51	62	68	53	65	65	61	38	29	13	1	0	0	0	0	592
10	0	0	0	0	0	4	16	35	51	55	62	70	77	83	65	56	44	35	14	1	0	0	0	0	668
11	0	0	0	0	0	6	21	37	54	63	74	83	85	75	70	54	45	28	13	1	0	0	0	0	709
12	0	0	0	0	0	6	22	38	53	67	78	83	85	81	73	61	46	29	11	0	0	0	0	0	733
13	0	0	0	0	0	7	22	38	54	68	78	77	85	81	72	60	46	23	12	0	0	0	0	0	723
14	0	0	0	0	0	6	22	38	54	68	78	85	85	82	73	61	45	30	13	1	0	0	0	0	741
15	0	0	0	0	0	6	21	37	53	67	78	84	85	83	74	61	46	30	13	1	0	0	0	0	739
16	0	0	0	0	0	6	20	34	53	66	77	82	84	81	73	60	45	27	9	1	0	0	0	0	718
17	0	0	0	0	0	7	21	38	48	63	79	85	83	83	75	62	47	31	11	1	0	0	0	0	734
18	0	0	0	0	0	6	21	37	54	67	78	84	86	82	74	62	46	30	13	1	0	0	0	0	741
19	0	0	0	0	0	6	21	37	53	68	78	84	86	83	74	62	47	30	13	2	0	0	0	0	744
20	0	0	0	0	0	4	21	30	49	71	82	89	85	52	53	40	45	29	13	1	0	0	0	0	664
21	0	0	0	0	0	6	20	36	52	65	59	24	58	67	42	26	19	19	5	4	0	0	0	0	502
22	0	0	0	0	0	6	20	32	51	65	62	36	52	51	71	50	34	11	12	2	0	0	0	0	555
23	0	0	0	0	0	6	11	35	52	66	64	74	71	73	61	44	24	21	4	0	0	0	0	0	606
24	0	0	0	0	0	6	18	35	23	58	74	65	68	61	49	19	1	1	4	1	0	0	0	0	483
25	0	0	0	0	0	6	15	33	51	64	77	73	52	73	10	17	16	2	0	0	0	0	0	0	489
26	0	0	0	0	0	4	20	35	50	65	76	84	68	83	58	52	42	10	5	1	0	0	0	0	653
27	0	0	0	0	0	5	19	35	50	64	45	58	63	74	55	44	36	30	12	1	0	0	0	0	591
28	0	0	0	0	0	3	12	29	45	56	69	80	83	64	72	60	45	31	13	1	0	0	0	0	663
29	0	0	0	0	0	2	9	33	52	61	64	66	62	82	69	58	42	32	13	1	0	0	0	0	646
30	0	0	0	0	0	4	20	37	52	65	76	82	83	81	72	61	46	30	14	2	0	0	0	0	725
TOTAL/10	0	0	0	0	0	15	55	102	148	168	198	208	209	206	183	158	106	65	27	2	0	0	0	0	

TOTAL NUMBER OF OBSERVATIONS = 8559. TOTAL = 18590.

: INDICATES CALIBRATION DURING THE HOUR

DIURNAL VARIATION OF BAROMETRIC PRESSURE

TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

	HOUR																								
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	795	794	794	794	794	795	795	794	794	794	794	793	793	792	791	791	791	790	790	790	790	791	791	791	792
2	791	791	791	791	791	791	791	791	791	791	791	790	790	789	789	789	789	789	789	789	789	791	791	791	790
3	791	791	791	791	791	791	791	792	792	792	792	791	791	791	791	790	790	790	790	791	791	792	792	793	791
4	793	793	793	794	794	794	795	795	795	795	795	795	794	794	793	793	793	793	794	795	795	795	795	796	794
5	796	796	796	796	796	796	797	797	797	797	796	796	795	794	794	793	793	794	795	796	795	796	796	796	795
6	796	796	796	796	796	796	796	796	796	796	796	796	795	795	795	794	794	794	794	794	794	795	795	794	795
7	794	794	794	794	794	795	794	795	794	794	794	793	793	792	791	791	791	791	790	791	791	791	791	791	792
8	790	790	790	790	790	790	790	790	789	789	788	788	788	788	787	786	786	786	786	786	786	787	787	788	788
9	788	787	788	788	788	788	788	788	789	789	789	788	788	787	787	786	786	786	786	786	787	787	788	789	787
10	789	789	789	790	790	790	790	791	791	791	791	791	791	790	790	790	790	790	790	791	791	791	791	791	790
11	791	791	791	791	792	792	792	792	792	792	792	792	791	791	790	790	789	789	789	789	789	790	790	790	790
12	790	790	790	790	790	791	791	791	790	790	790	790	790	789	789	789	789	789	789	789	789	789	790	790	789
13	790	790	790	790	790	791	791	792	791	791	792	791	791	790	789	789	789	789	789	789	789	790	790	790	790
14	791	791	791	791	791	791	791	792	792	792	792	792	791	791	791	791	790	790	790	790	791	791	791	791	791
15	791	791	791	792	792	792	792	793	792	792	792	792	791	791	791	790	790	790	790	790	791	791	791	791	791
16	791	791	791	791	791	791	792	792	791	791	791	791	791	790	790	790	789	789	789	790	790	791	791	791	790
17	791	791	791	791	791	791	791	791	791	791	790	790	789	789	789	788	788	788	788	788	788	788	788	788	789
18	788	788	789	789	789	790	790	790	790	790	790	790	790	789	789	789	789	788	788	789	789	789	789	789	789
19	789	790	791	791	791	791	791	791	790	790	790	790	790	789	789	789	788	788	788	788	788	788	788	788	789
20	788	788	788	788	789	789	790	790	790	789	789	788	788	788	787	787	787	787	787	787	788	788	788	789	788
21	789	789	790	789	789	789	790	790	790	790	789	789	789	789	790	789	789	789	789	790	791	792	792	792	789
22	792	792	792	792	792	792	792	792	792	791	791		791	791	790	790	790	790	790	790	790	790	791	791	791
23	791	791	791	792	792	792	792	793	793	792	792	792	791	791	791	790	790	790	791	791	792	793	793	793	791
24	793	793	793	793	793	793	794	794	794	794	794	793	792	792	792	792	792	792	792	792	792	793	793	793	793
25	793	793	793	793	793	793	794	794	794	793	793	793	792	792	791	791	791	791	791	792	792	792	793	793	792
26	793	792	793	793	793	793	794	794	794	794	794	793	793	792	792	791	791	790	790	791	791	792	792	792	792
27	792	792	792	792	792	792	793	793	793	793	793	793	793	792	791	791	791	791	791	791	791	793	793	793	792
28	794	794	794	794	794	794	795	795	796	796	795	795	794	793	793	792	792	791	791	791	791	791	792	792	793
29	792	792	792	792	792	792	792	792	792	792	791	791	790	789	789	788	788	787	787	788	788	789	789	790	790
30	790	791	791	791	791	791	791	792	792	791	791	791	791	791	790	790	790	790	790	790	790	791	791	792	790
MEAN	791	791	791	791	791	792	792	792	792	792	792	791	791	790	790	790	789	789	790	790	790	791	791	791	

TOTAL NUMBER OF OBSERVATIONS = 8600. MEAN = 791.

: INDICATES CALIBRATION DURING THE HOUR

RADIAN CORPORATION

```
              DIURNAL VARIATION OF HORIZONTAL BI-VANE WIND DIRECTION AT 200 FEET
                        TRAILER NO. - 23  PERIOD( 6/ 1/77 TO  6/30/77)

                                                 HOUR
        1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24 MEAN
DAY

 1    183 117 164 245 113 149 125 100  26 319 290  84 182 212 254 298 296 251  73 145 221 285 266 207   192
 2    185 211 202 214 211 201 186 227 216 217 216 209 207 222 229 261 301 235 215 219 227 153 151 154   211
 3    167 169 180 137 138 167 175 200 203 214 221 214 225 222 238 239 231 230 241 227 223 200 125 132   197
 4    135 150  99 143 167 127 113 163 200 105 121 193 151 231 182  97  68 118 161 151 176 155 107 113   143
 5    111 144 141 200 201 113 111 125 156 163 149 138 130 130 100 115 171 138 191 192 161 123 178 190   149
 6    109 197 223 170 118 152 159 155 156 188 166 179 220 131 167 161  69  66  47 124 168 136 128 206   150
 7
 8
 9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
MEAN   149 165 168 185 158 152 145 162 160 201 194 169 186 191 195 195 190 173 155 176 196 175 159 167

                    TOTAL NUMBER OF OBSERVATIONS =   1726,    MEAN  =    174,

             : INDICATES CALIBRATION DURING THE HOUR
```

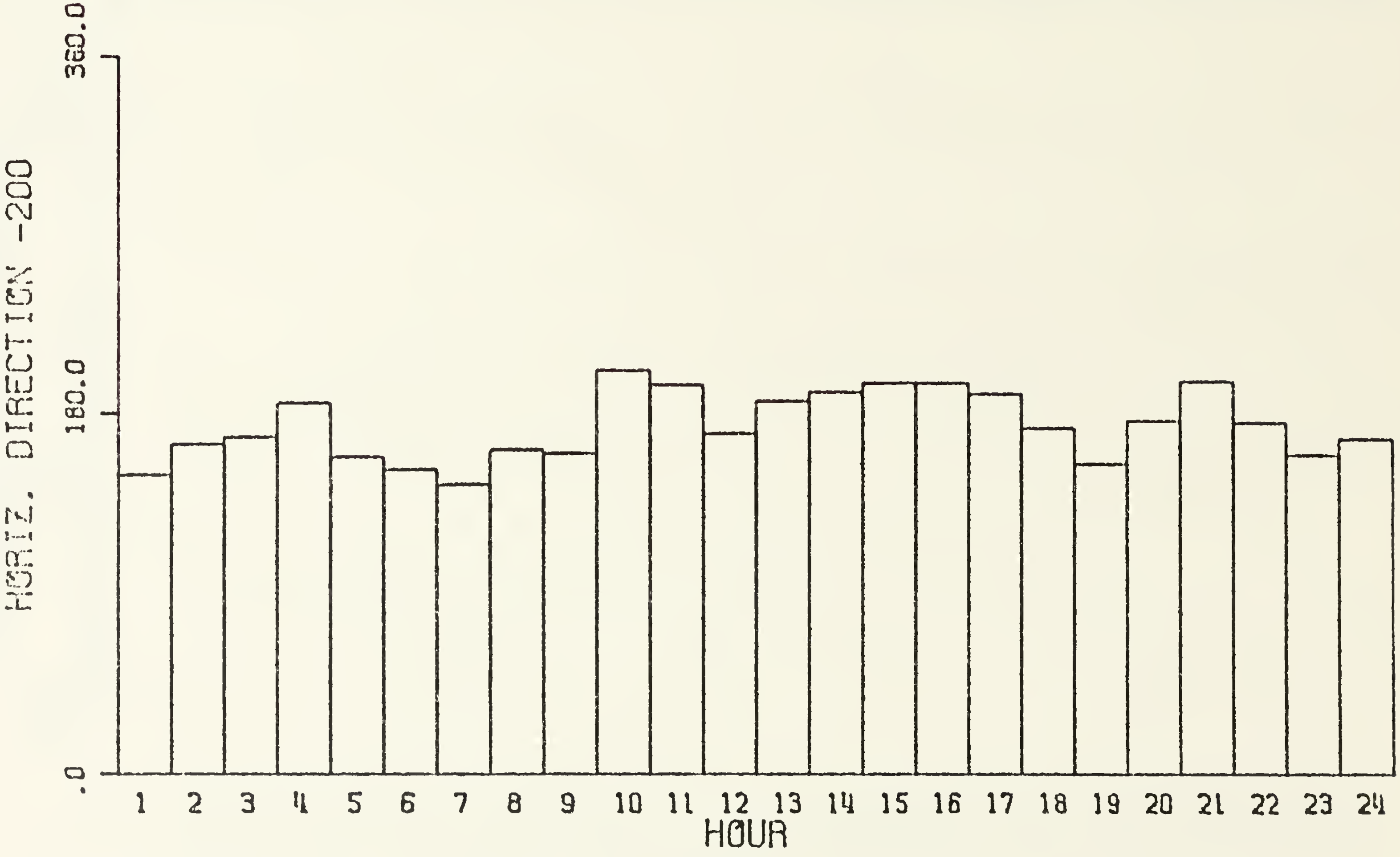
DIURNAL VARIATION OF VERTICAL BI-VANE WIND DIRECTION AT 200 FEET
TRAILER NO. - 23 PERIOD(6/ 1/77 TO 6/30/77)

HOUR

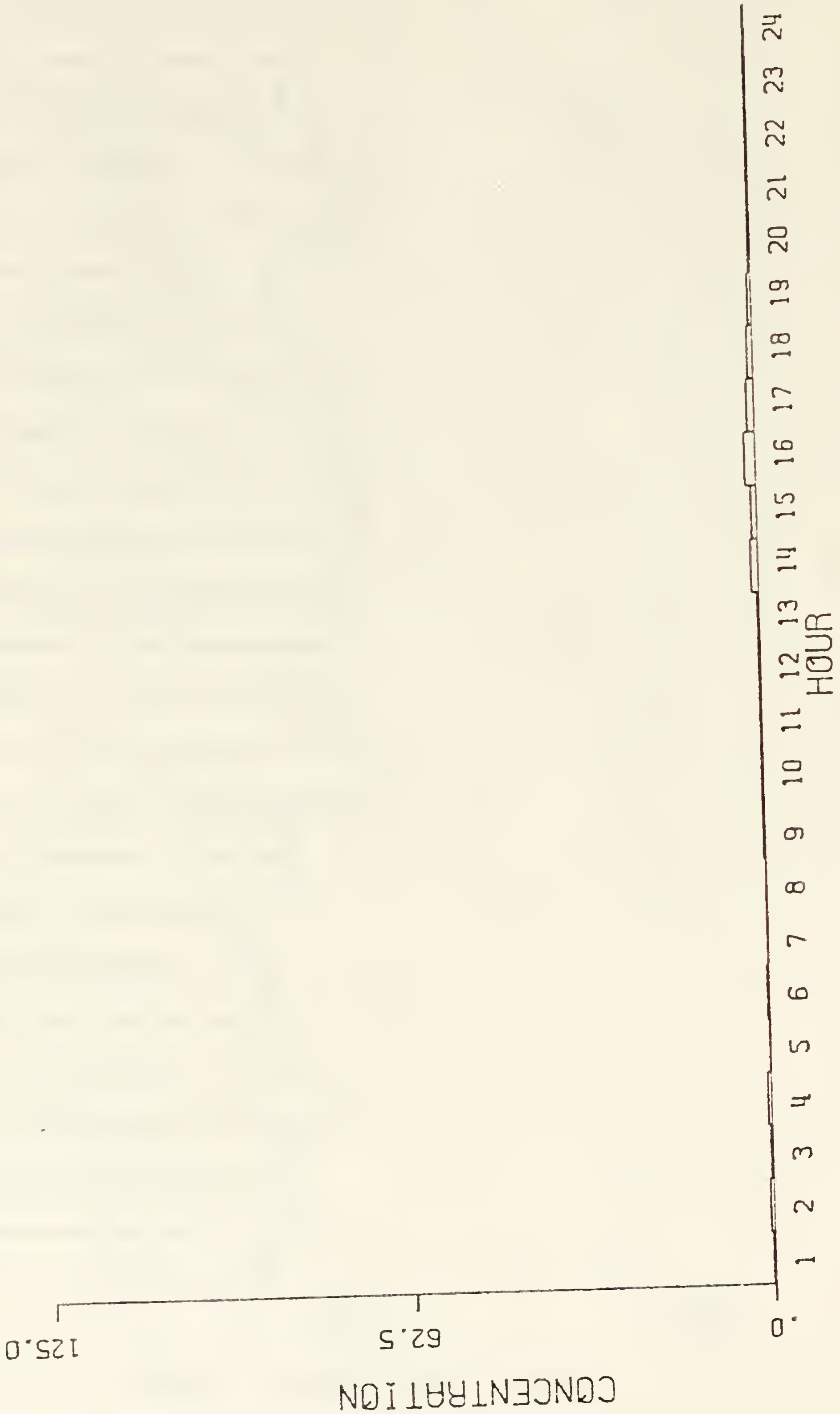
DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN
1	3	0	4	0	0	5	0	7	-5	-1	-2	-5	-3	-1	-5	4	-2	0	-4	-3	-4	-7	-7	-1	-1
2	3	-4	-4	-3	-9	-3	-2	4	-4	-2	-9	-3	-7	-6	-5	1	-2	8	-7	-12	-8	9	19	-3	-3
3	-4	4	-6	-9	-10	-1	5	0	-3	-5	-6	-5	-1	0	-3	-4	-2	-2	-11	-8	0	-3	2	-5	-4
4	-3	1	0	-2	-2	-3	-2	1	0	0	9	12	0	5	18	25	19	0	7	-3	-2	5	0	0	3
5	0	5	40	8	13	13	7	-5	-5	-3	0	0	-1	-5	-1	2	-1	-3	-9	-13	-10	-7	0	3	0
6	-6	7	15	7	4	-13	-12	-11	-4	-5	-15	-17	-9	-5	-17	-15	-7	-6	0	-3	-1	0	0	7	-5
7	11	7	-1	6	-1	-6	-12	-3	-13	-12	0	0	-12	-12	-12	-10	-12	-12	-13	-17	-13	-15	-15	-13	-8
8	-16	-17	-15	-17	-14	-15	-10	-11	-6	-3	-3	-13	-14	-10	-7	3	-12	-8	-12	-14	-12	-3	-17	-17	-12
9	-10	-16	-12	-10	-17	-12	-17	-14	-15	-14	-15	-13	-17	-17	-17	-17	-19	-16	-18	-18	-17	-1	-12	-6	-15
10	-10	-13	-5	-5	-8	-9	-6	-7	-15	-17	-18	-17	-18	-18	-17	-14	-15	-16	-13	-12	-10	-5	0	2	-12
11	1	5	15	33	4	-2	12	-8	-20	-16	-18	-16	-13	-12	-17	-16	-13	-18	-17	-9	-2	-11	-1	1	-6
12	-2	-13	-13	-15	-11	-10	7	0	-4	-15	-11	-9	-12	-8	-10	-7	-6	-5	-4	-5	-7	1	3	2	-7
13	-1	5	-2	-5	10	11	-6	-3	-6	-3	-5	-2	-3	-6	-7	-4	-5	8	21	29	21	4	0	0	1
14	-4	1	0	0	-2	-1	0	0	0	-3	-7	-7	-5	-6	-5	-6	-6	-8	-8	-5	1	0	-4	-4	-4
15	-6	1	11	3	2	0	0	4	7	0	-5	-6	-6	-3	-4	-5	-3	-4	-3	3	43	28	32	12	4
16	13	12	2	14	8	10	13	11	2	-5	0	-5	-6	-6	-6	-5	-5	-6	-3	4	1	5	-2	18	2
17	6	10	10	20	15	5	2	16	0	12	-1	-3	-4	-4	-2	2	-7	-8	-6	15	35	39	9	-4	6
18	0	0	5	-6	-8	-7	-5	-1	-1	6	15	15	15	15	14	15	19	20	19	16	41	46	48	-3	11
19	-3	-3	0	0	23	10	10	3	4	27	20	22	6	-6	-7	-6	-6	-4	-9	32	3	0	36	26	7
20	0	2	-4	-6	-4	28	27	2	-4	-3	-6	-7	-3	-5	-5	-4	-4	-5	-4	-3	10	14	9	-1	-0
21	0	7	11	1	-4	-4	8	-2	0	-3	-3	-5	0	0	0	-4	-3	-2	2	0	33	16	3	0	1
22	16	13	9	6	-1	0	11	0	5	0	-2		6	0	0	-2	-1	19	7	8	13	-1	-2	5	4
23	13	3	10	0	0	6	5	9	0	7	0	5	-6	0	-2	-4	-2	10	14	9	-3	-7	-2	5	3
24	-2	0	5	5	1	0	-1	-5	-6	-6	-4	0	7	0	0	-2	0	-2	-7	0	-3	-5	-5	-4	-2
25	-4	-7	-6	-7	-6	-3	-3	2	-5	-3	-4	-5	-3	-6	-4	-7	-6	-6	-8	-12	-8	-9	-6	-4	-6
26	-6	-4	1	0	-1	0	-3	1	-2	-7	-8	-7	-4	-9	-8	-5	-3	-4	34	15	24	47	21	7	2
27	-6	-4	0	2	1	3	-1	-1	-10	-9	-9	-10	-12	-13	-5	-8	-11	-7	-9	-5	6	6	7	13	-4
28	7	24	38	5	8	9	5	6	-7	0	-5	-22	-38	-5	0	-1	-3	-4	-2	0	8	-8	-1	-4	-0
29	1	-1	14	[illegible]	0	10	0	6	11	-5	-2	0	6	6	10	13	21	26	11	-6	2	20	-3	-2	6
30	4	10	8	1	0	9	14	7	12	0	-8	1	0	-4	-3	-6	-6	-7	-6	-3	0	-3	6	40	2
MEAN	-0	0	3	0	-0	0	1	-0	-3	-3	-5	-5	-6	-5	-5	-3	-4	-3	-2	-1	4	4	3	1	

TOTAL NUMBER OF OBSERVATIONS = 8586. MEAN = -1.

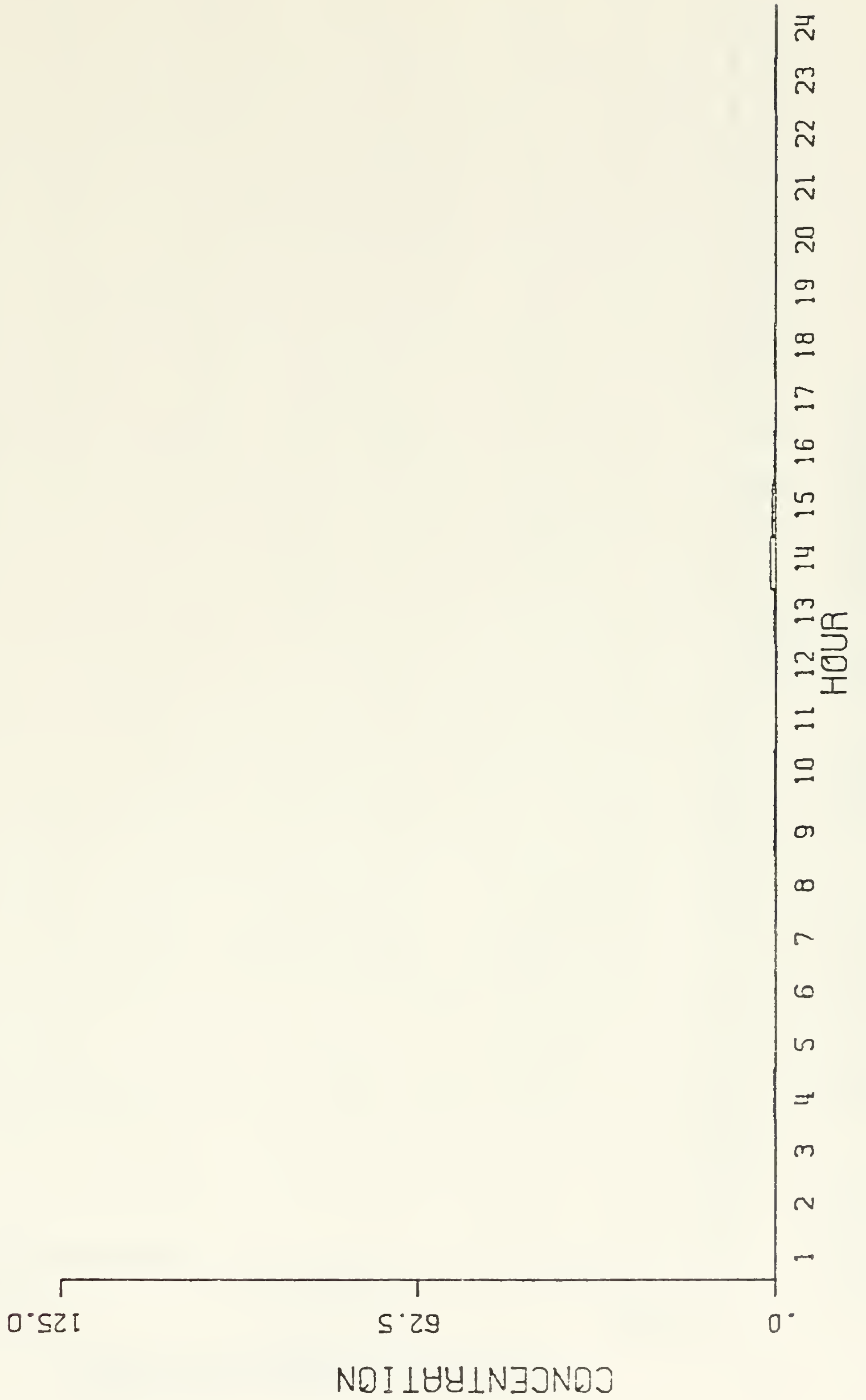
* INDICATES CALIBRATION DURING THE HOUR



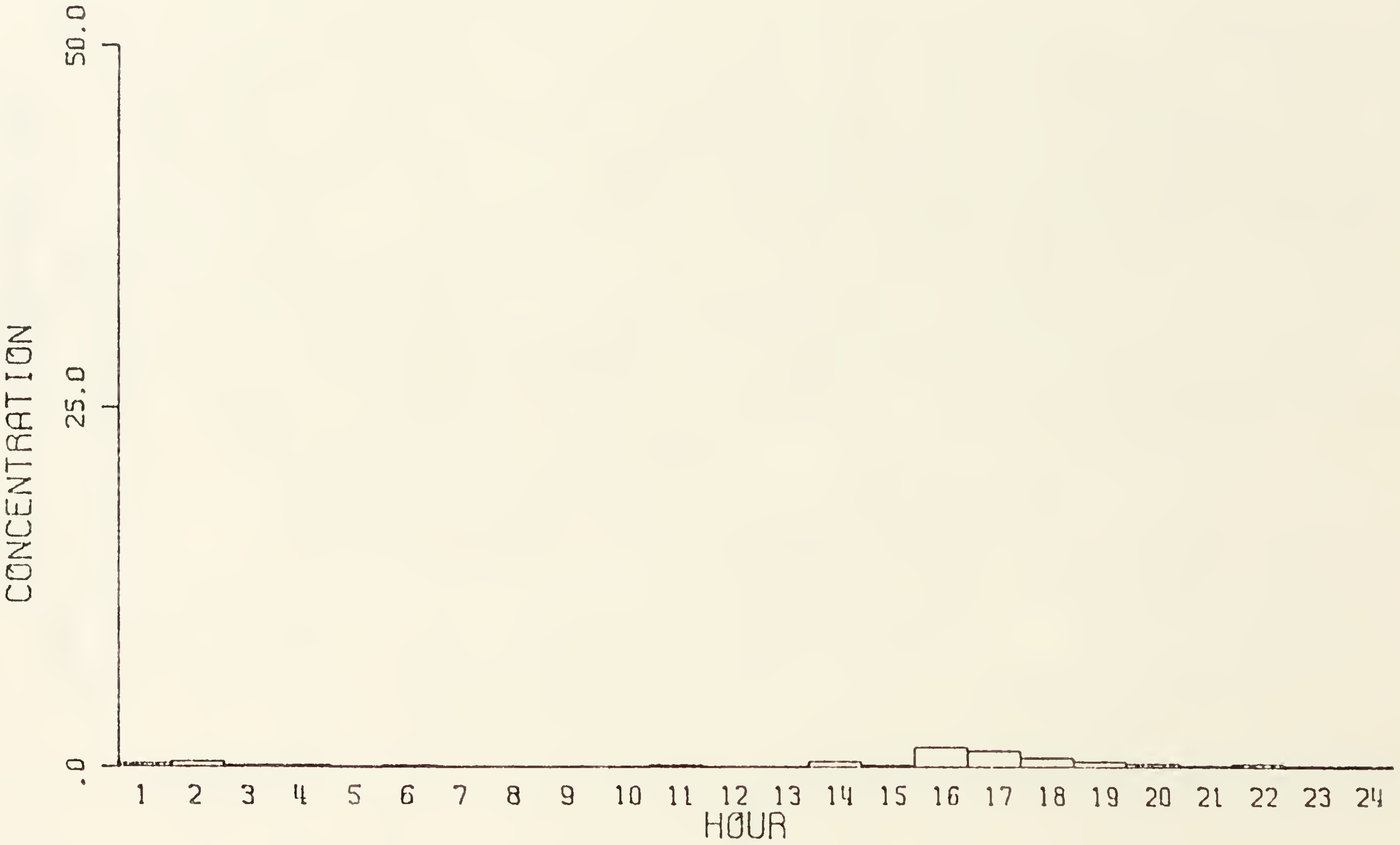
DIURNAL VARIATION OF HORIZONTAL BI-VANE WIND DIRECTION AT 200 FEET
SITE -- 23



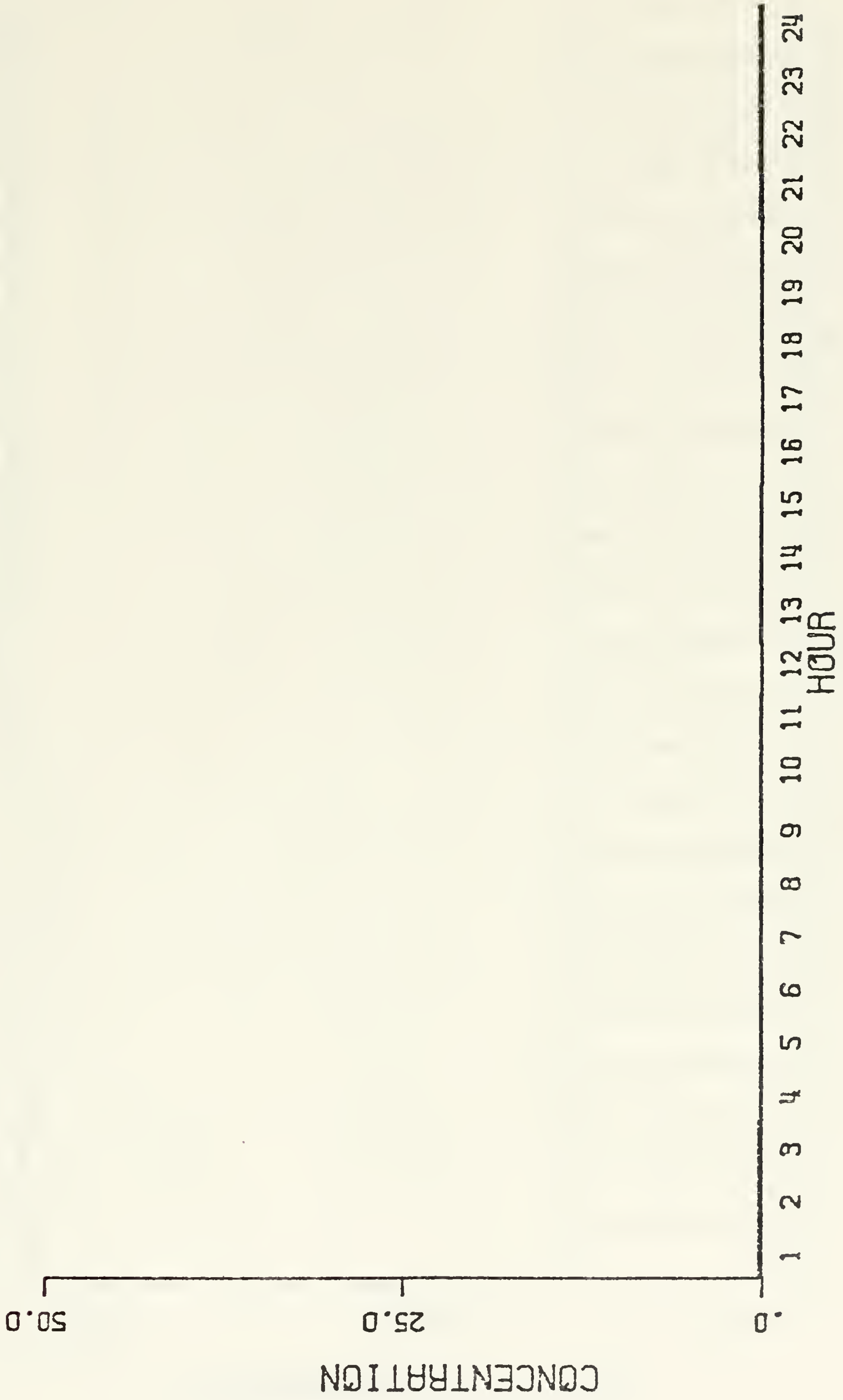
DIURNAL VARIATION OF NITROGEN OXIDES(UG/M**3)
SITE - 23



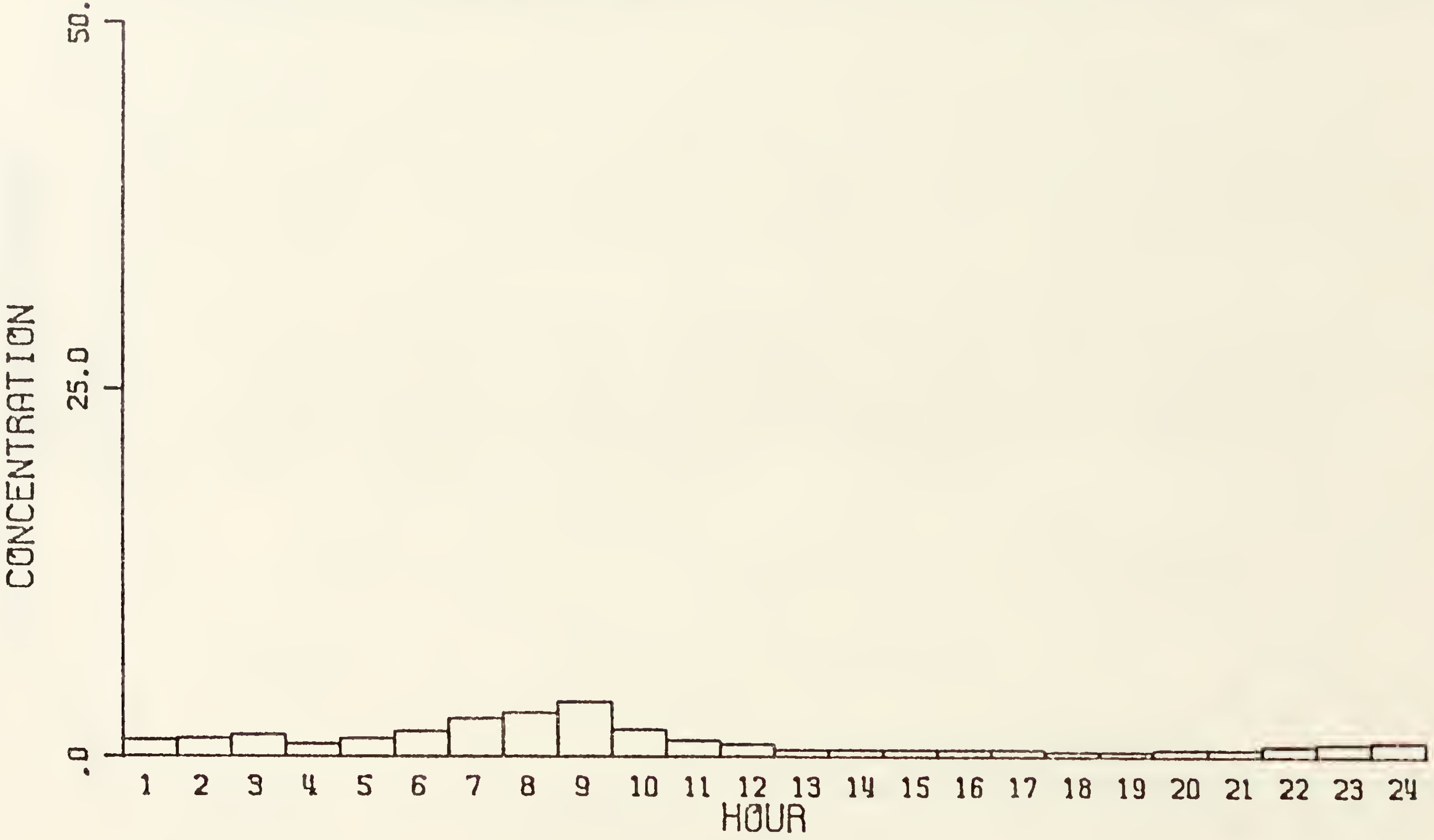
DIURNAL VARIATION OF NITRIC OXIDE (UG/M**3)
SITE - 23



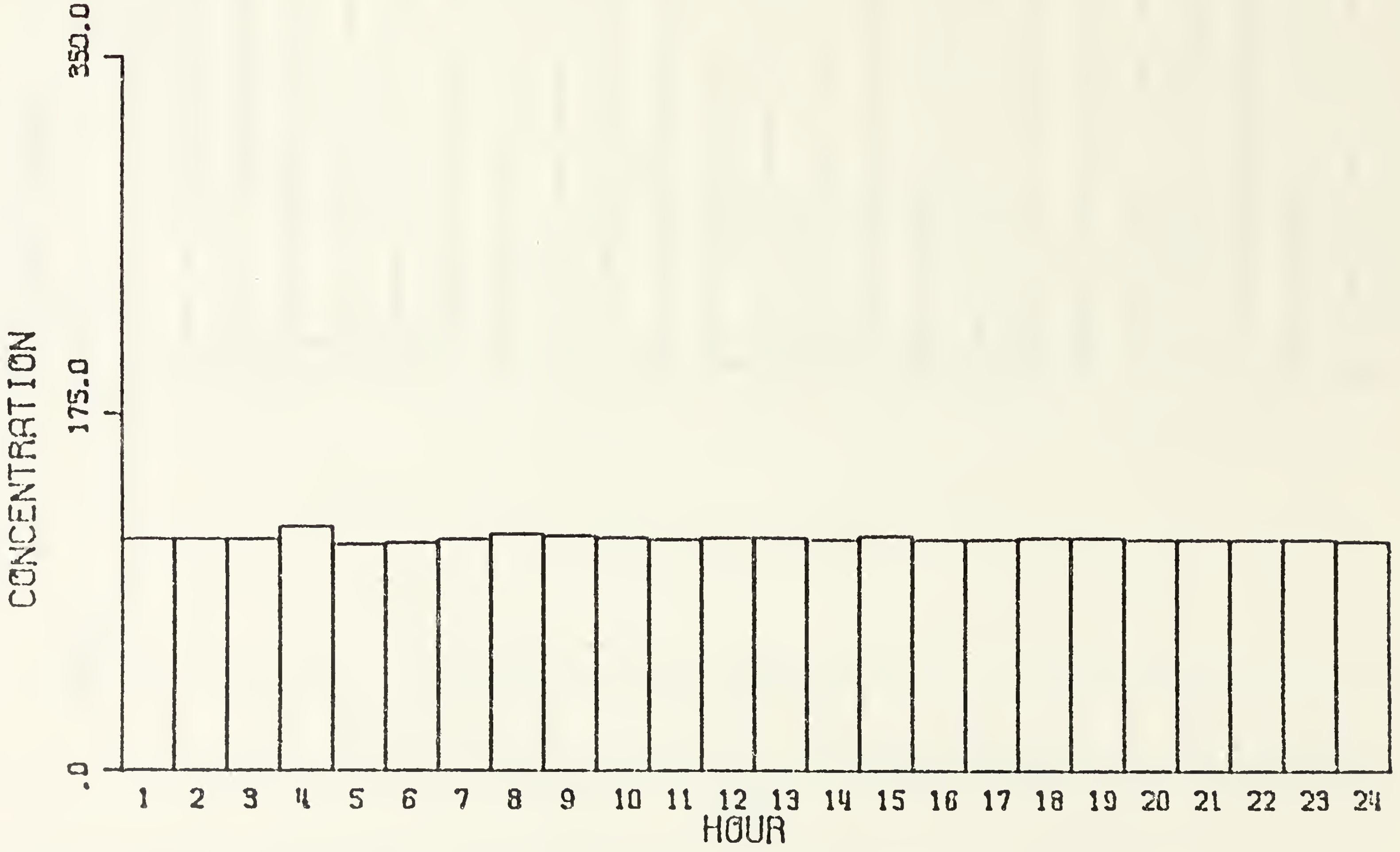
DIURNAL VARIATION OF NITROGEN DIOXIDE (UG/M**3)
SITE - 23



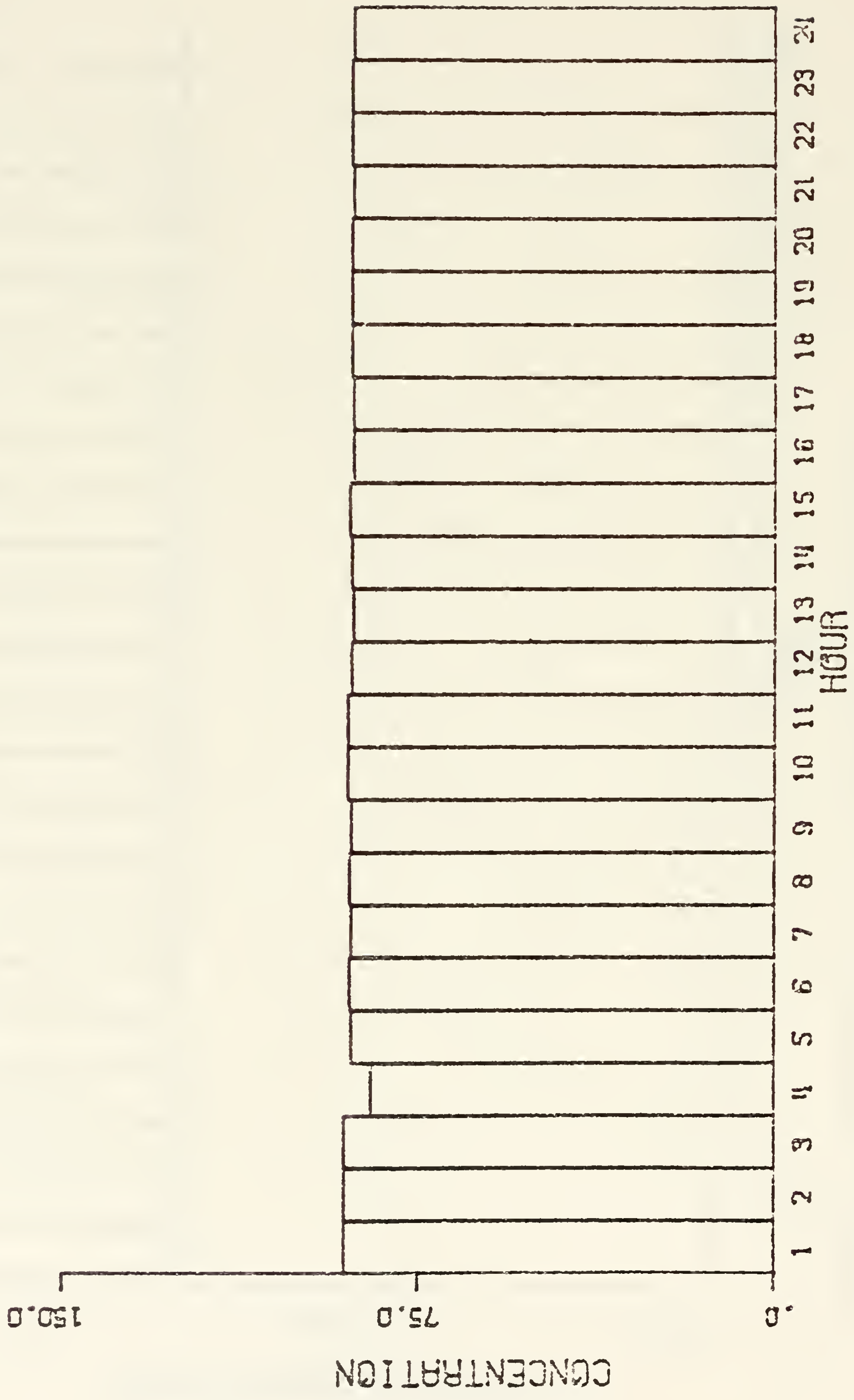
DIURNAL VARIATION OF SULFUR DIOXIDE (UG/M**3)
SITE - 23



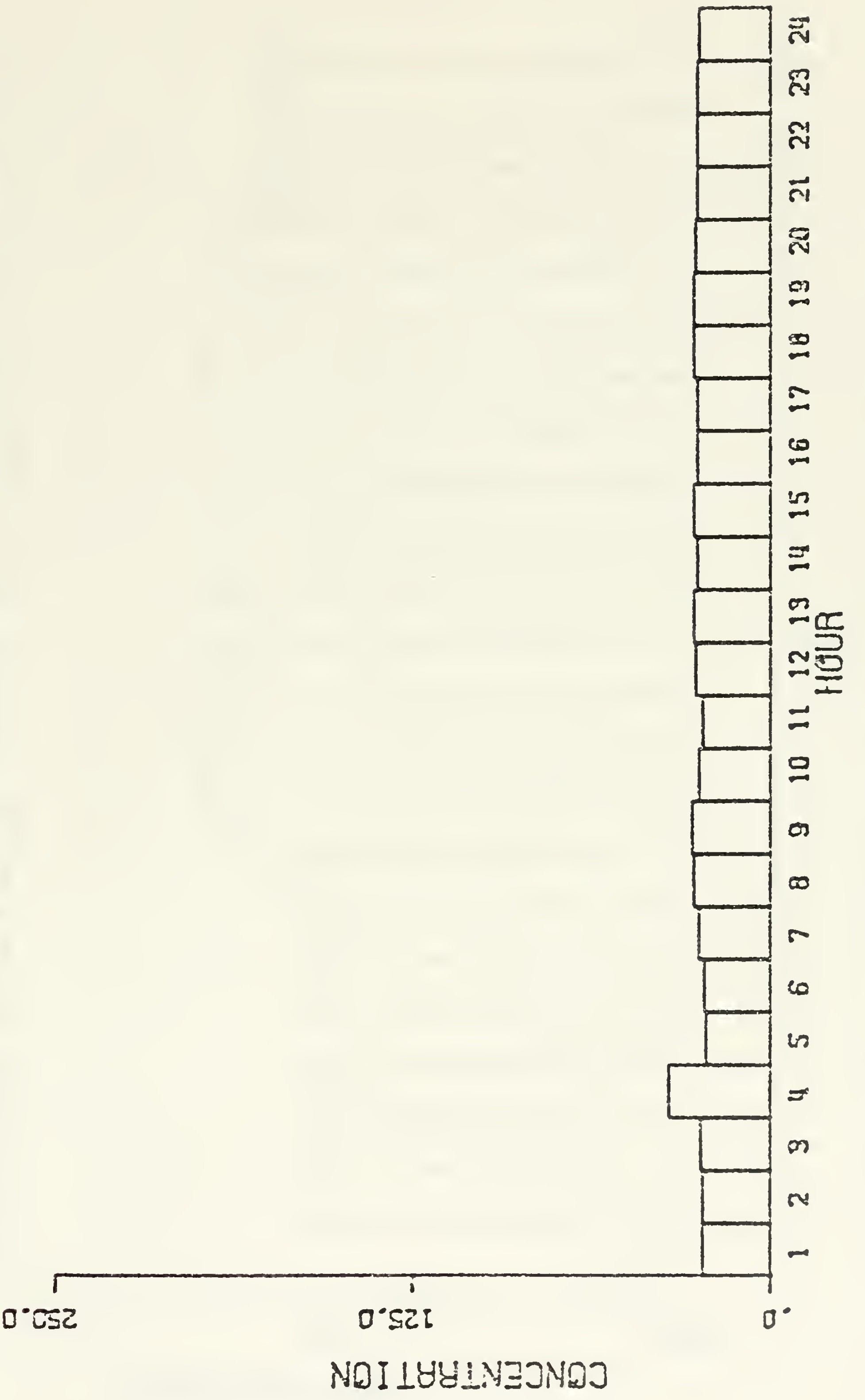
DIURNAL VARIATION OF SULFUR DIOXIDE(UG/M**3)
SITE - 23



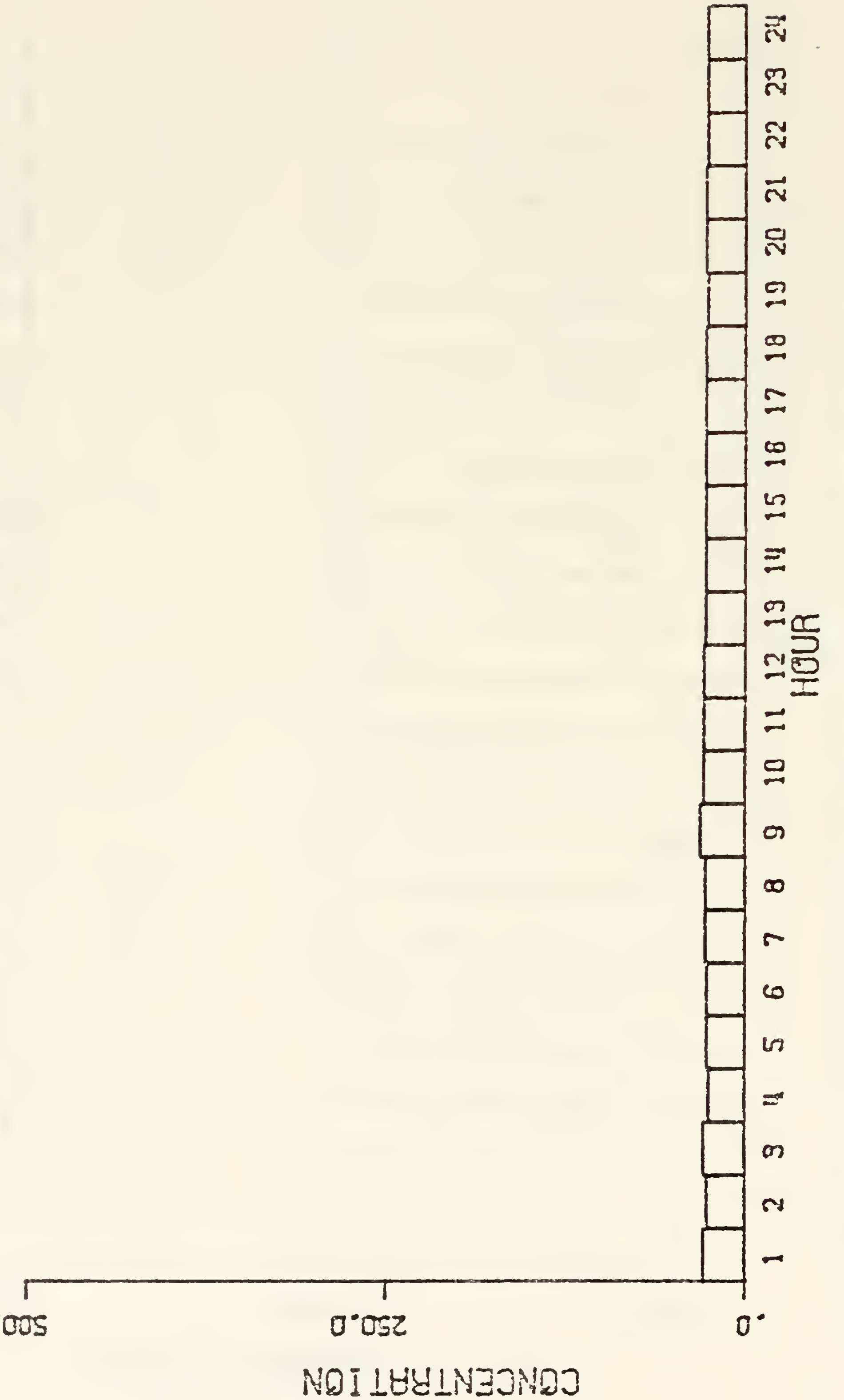
DIURNAL VARIATION OF TOTAL HYDROCARBONS(UG/M**3 X 10**-1)
SITE - 23



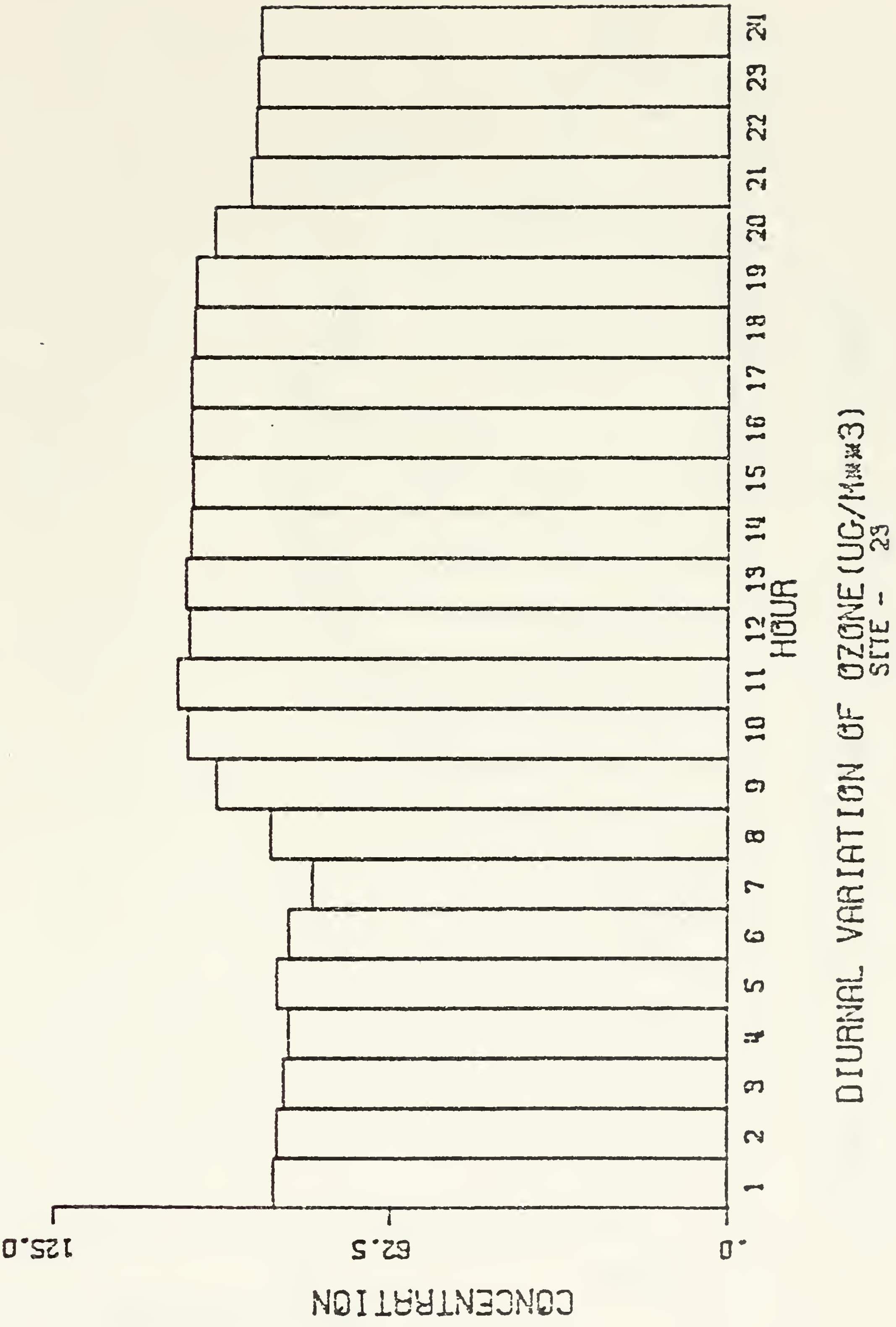
DIURNAL VARIATION OF METHANE (UG/M**3 X 10**-1)
SITE - 23

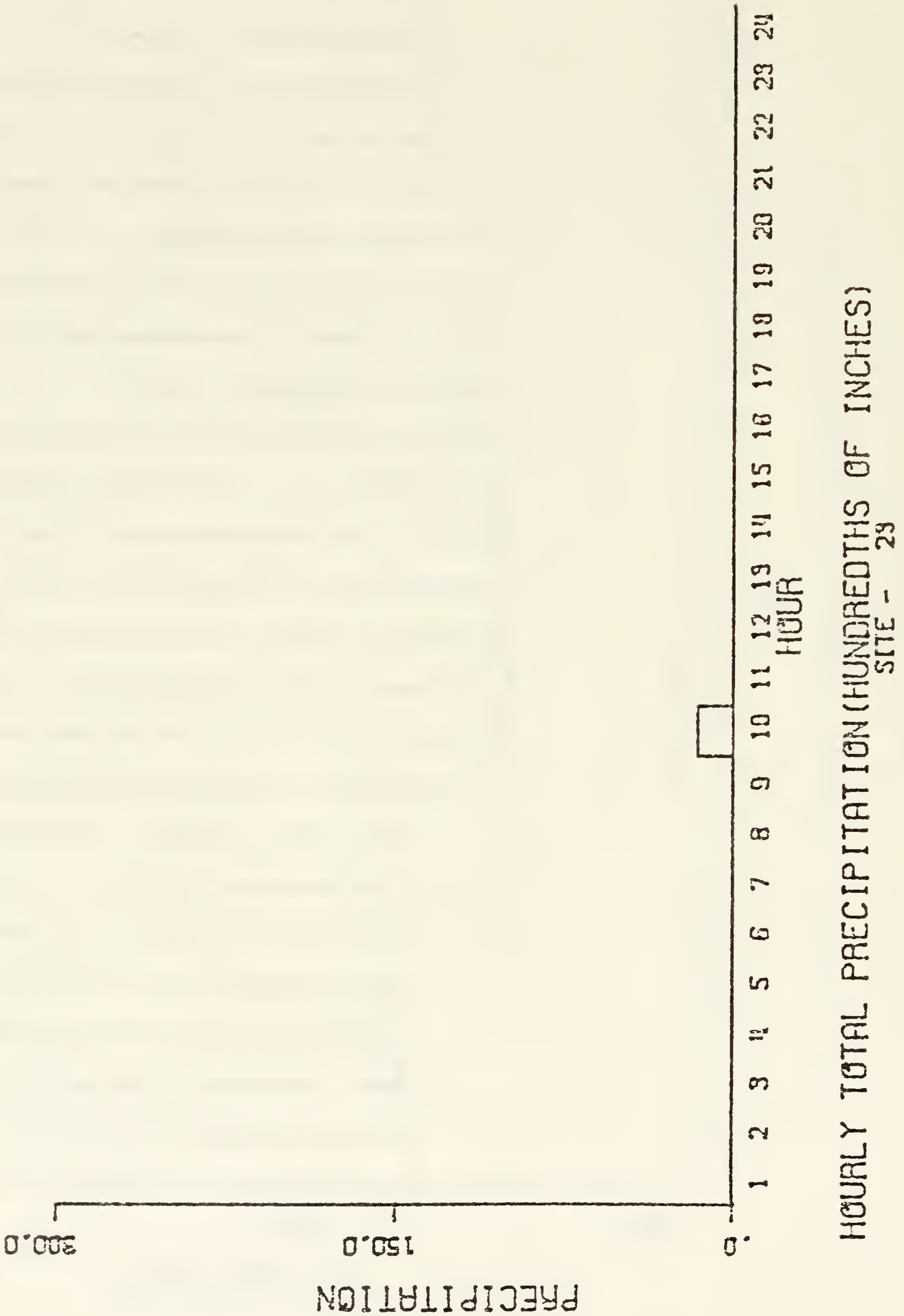


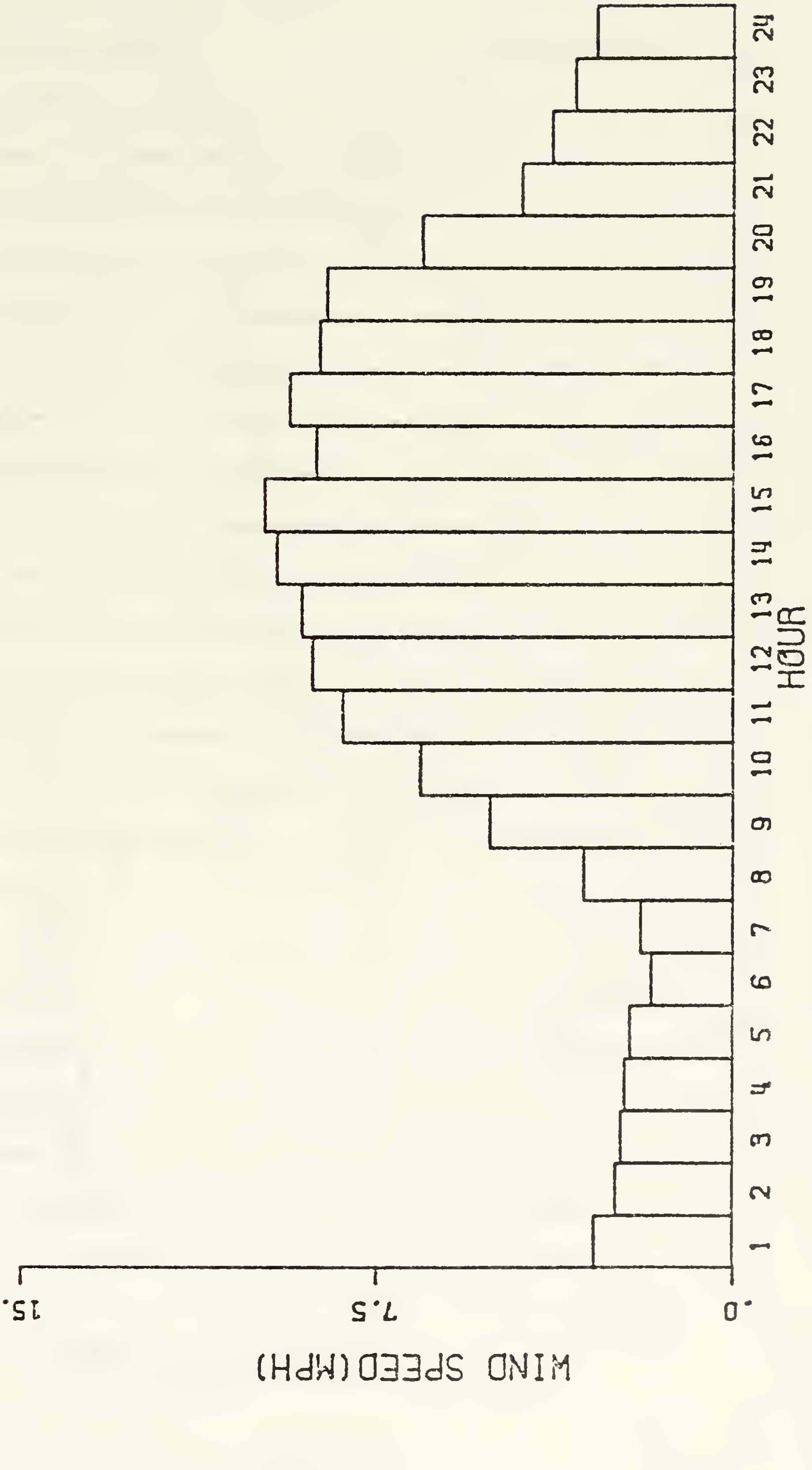
DIURNAL VARIATION OF NON-METHANE HYDROCARBONS(UG/M**3 X 10**-1)
SITE - 23



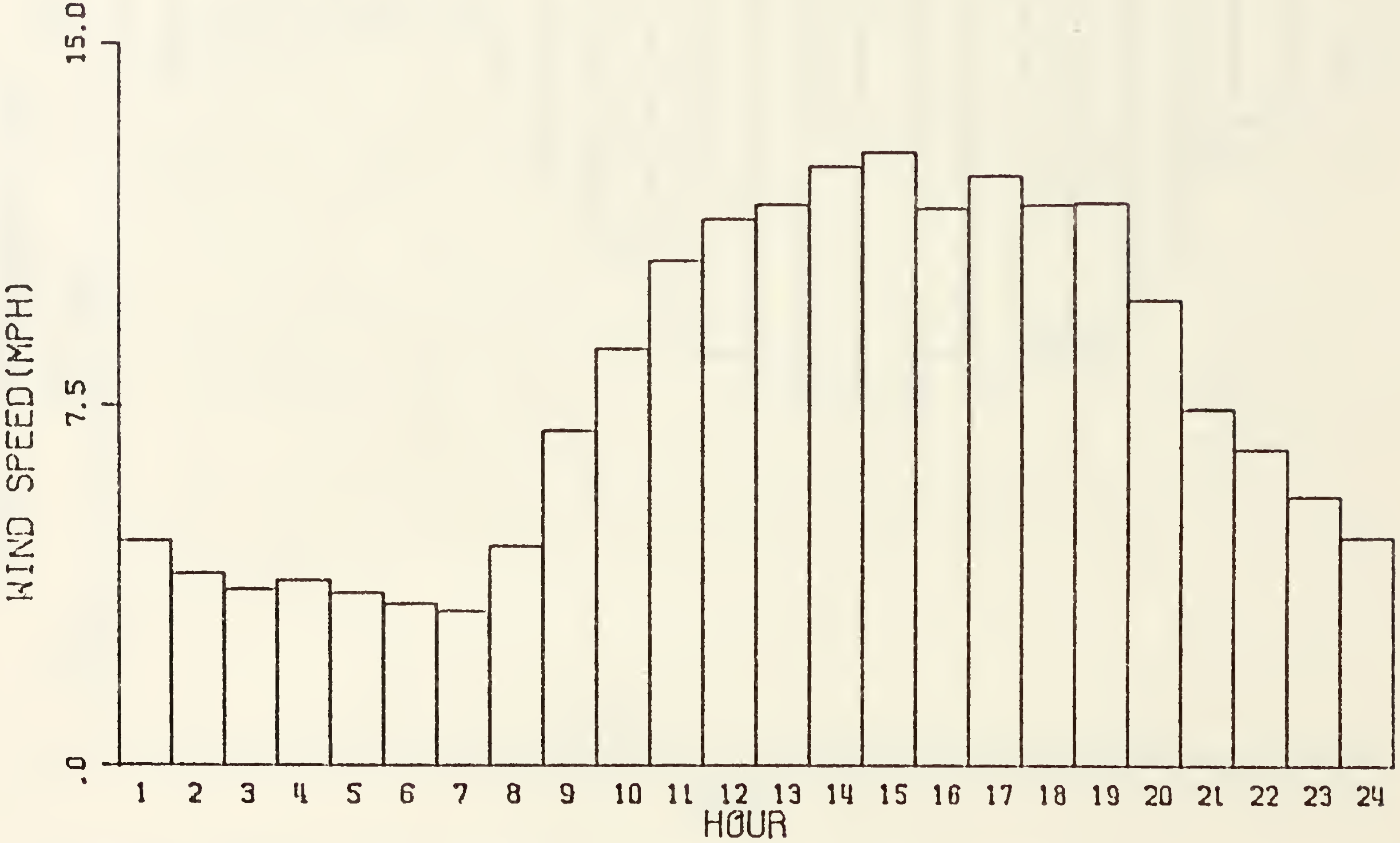
DIURNAL VARIATION OF CARBON MONOXIDE (UG/M**3 X 10**-1)
SITE - 29


DIURNAL VARIATION OF OZONE(UG/M**3)
SITE - 23
HOUR
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
CONCENTRATION
0.
62.5
125.0

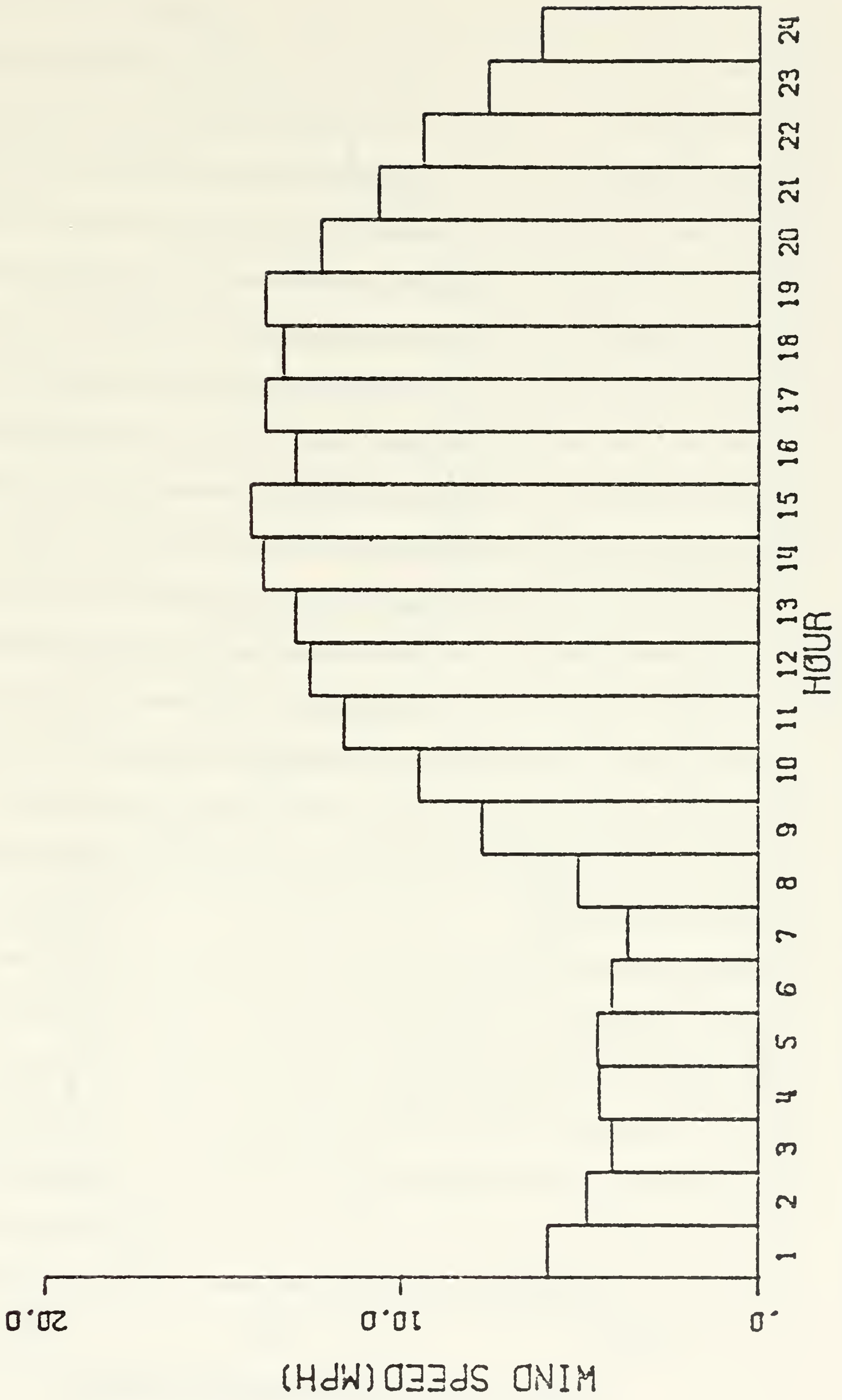

HOURLY TOTAL PRECIPITATION (HUNDREDTHS OF INCHES)
SITE - 23
HOUR
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
PRECIPITATION
0.
150.0
300.0



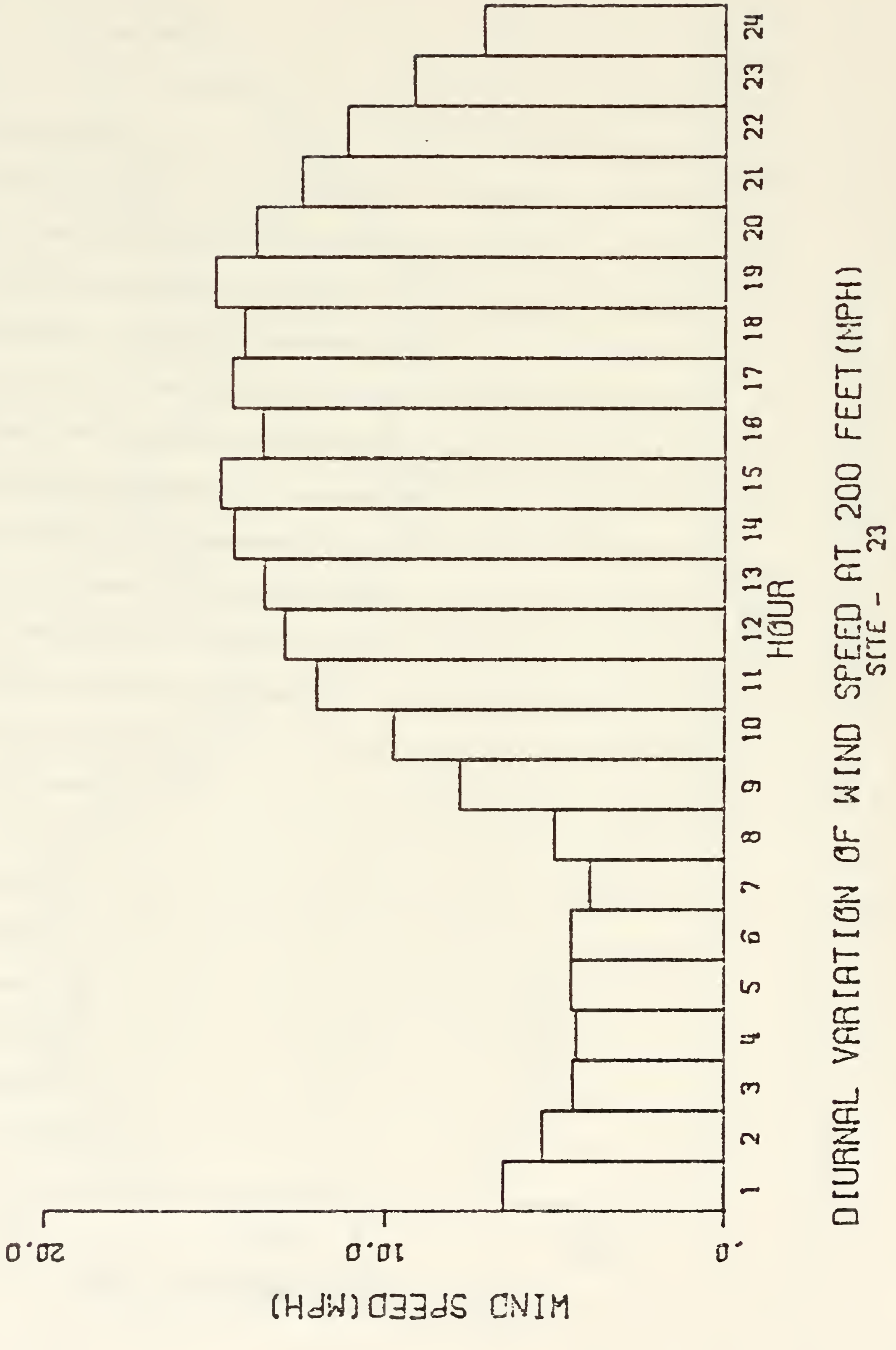
DIURNAL VARIATION OF WIND SPEED AT 8 FEET (MPH)
SITE - 23

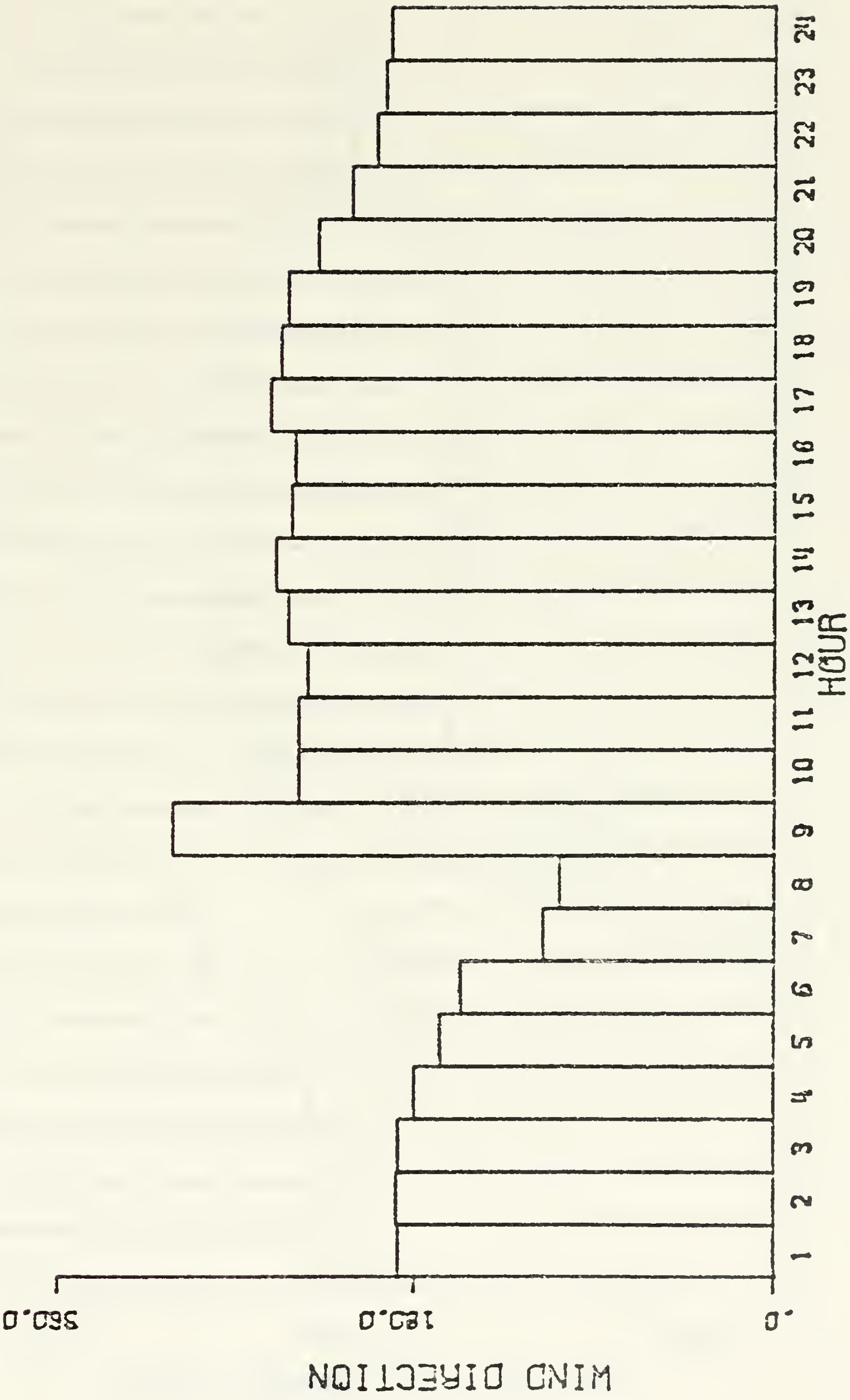


DIURNAL VARIATION OF WIND SPEED AT 30 FEET (MPH)
SITE - 23

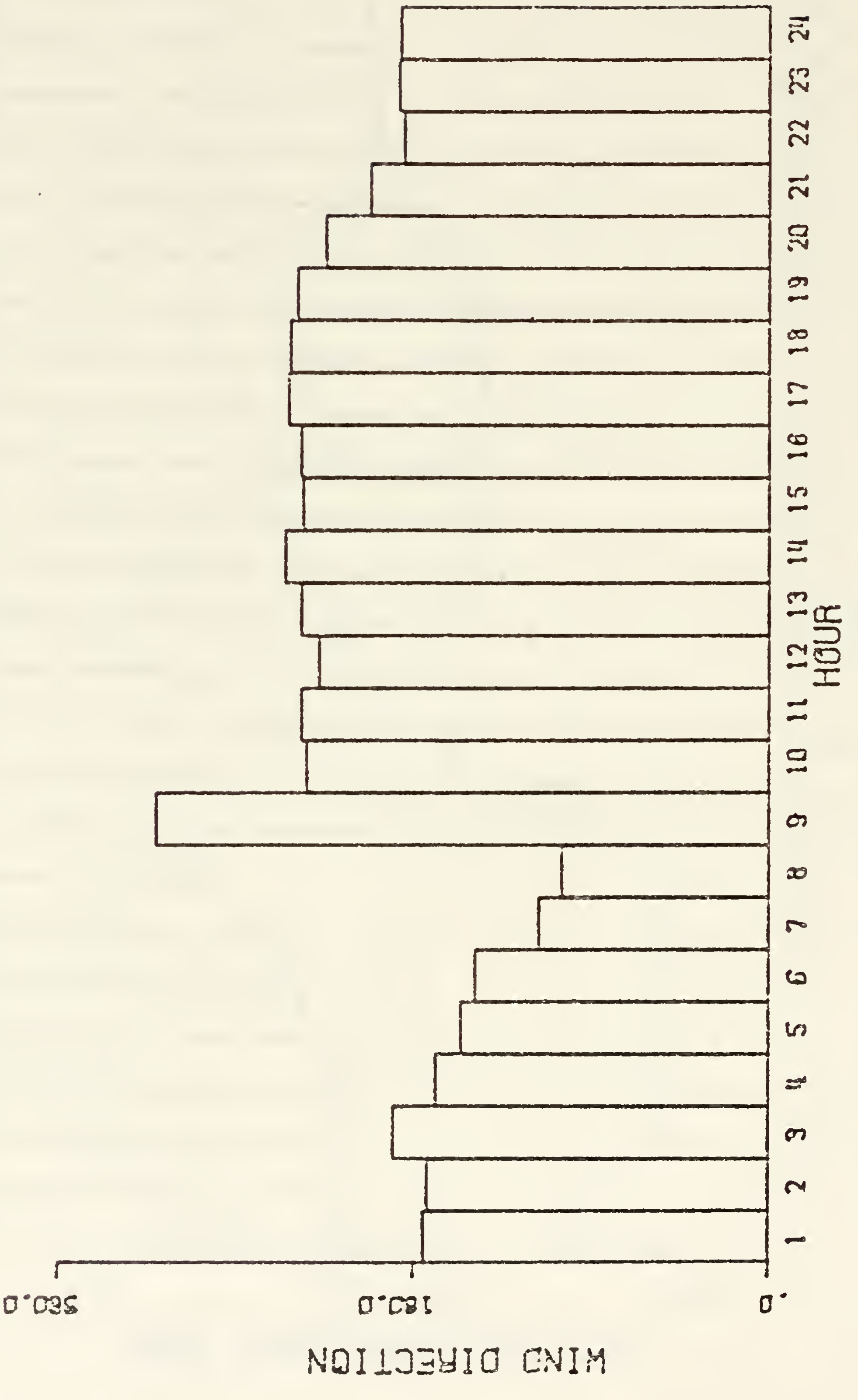


DIURNAL VARIATION OF WIND SPEED AT 100 FEET (MPH)
SITE - 23

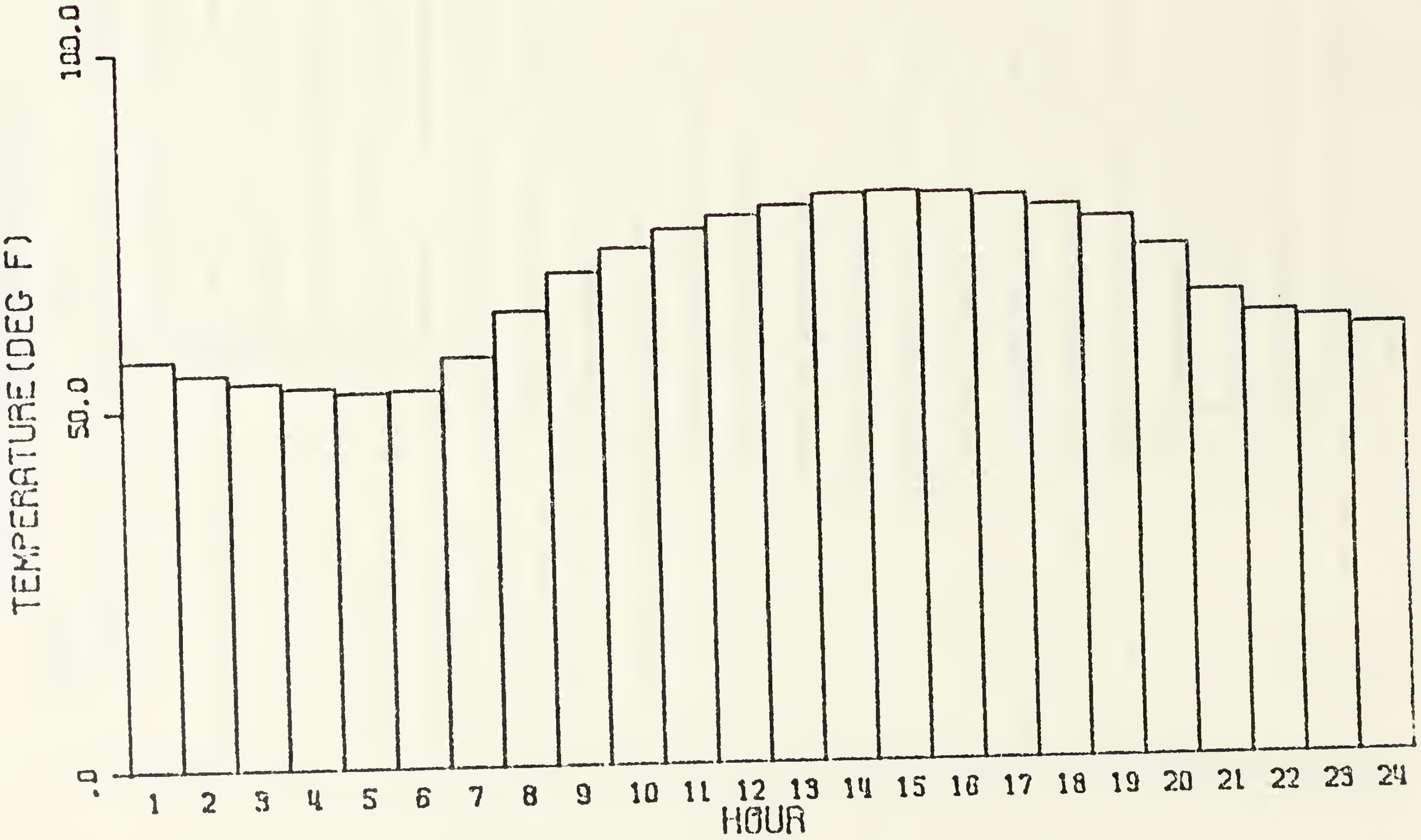

WIND SPEED(MPH)
20.0
10.0
0.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
HOUR
DIURNAL VARIATION OF WIND SPEED AT 200 FEET(MPH)
SITE - 23



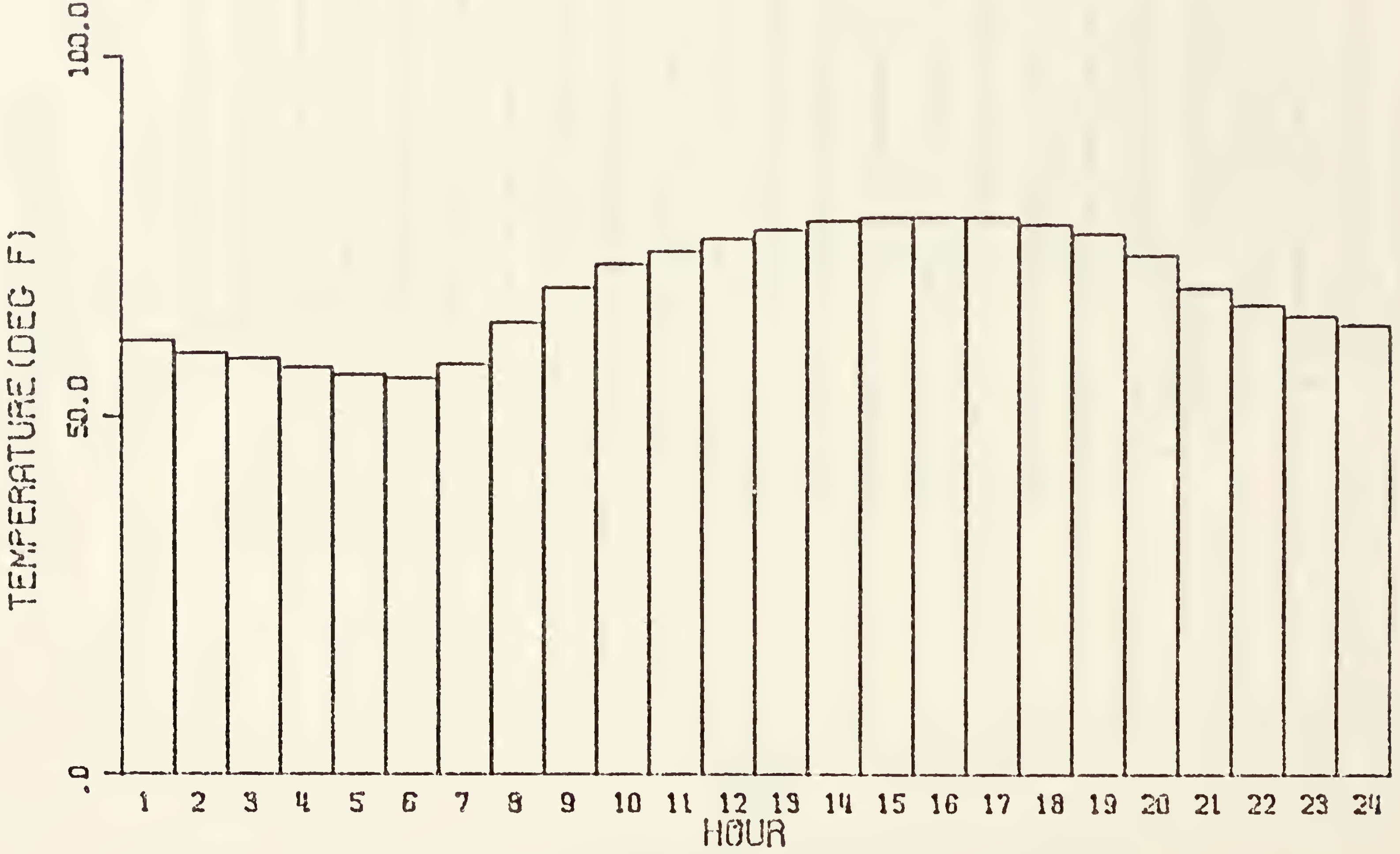
DIURNAL VARIATION OF WIND DIRECTION AT 8 FEET
SITE - 23



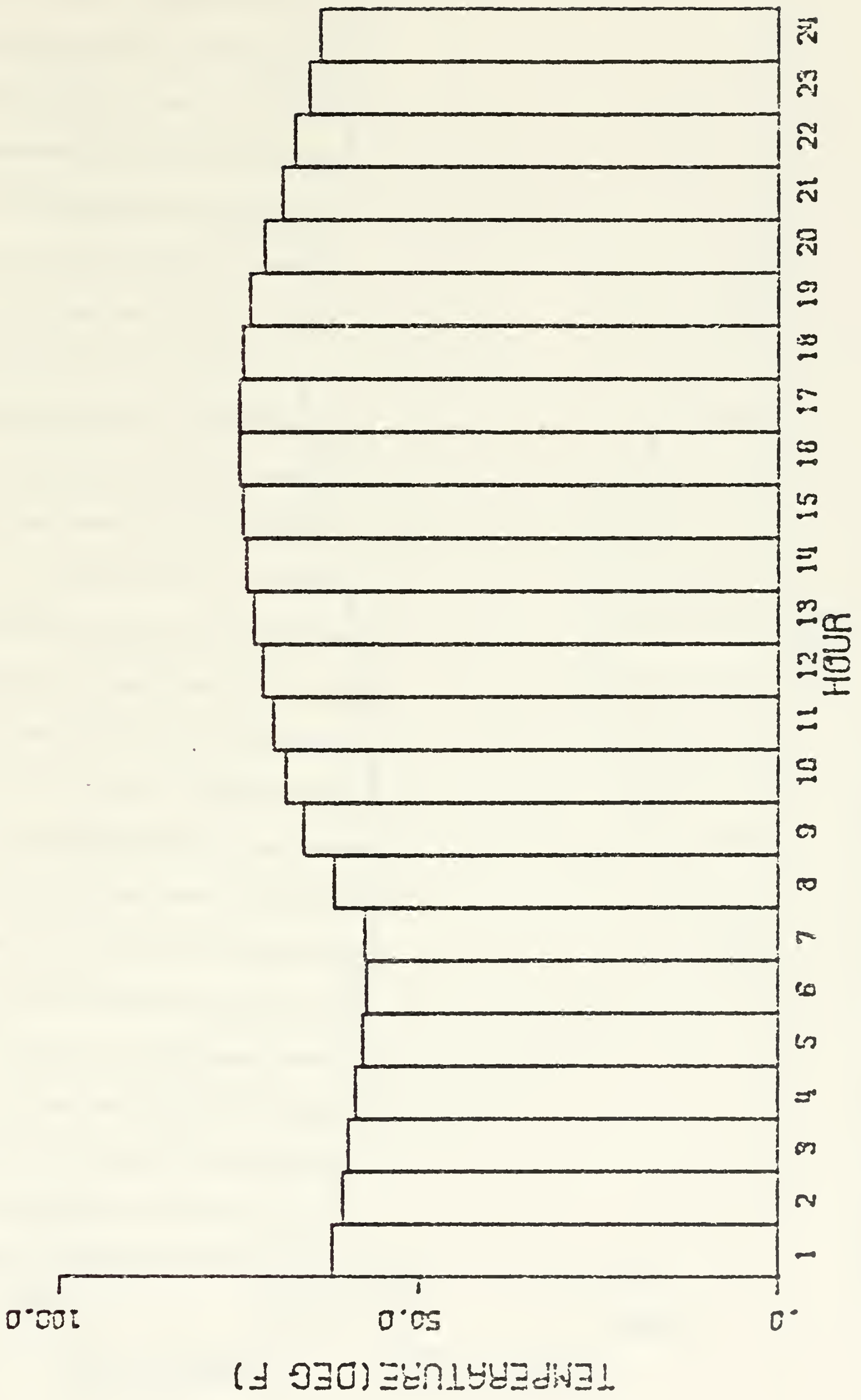
DIURNAL VARIATION OF WIND DIRECTION AT 30 FEET
SITE - 23



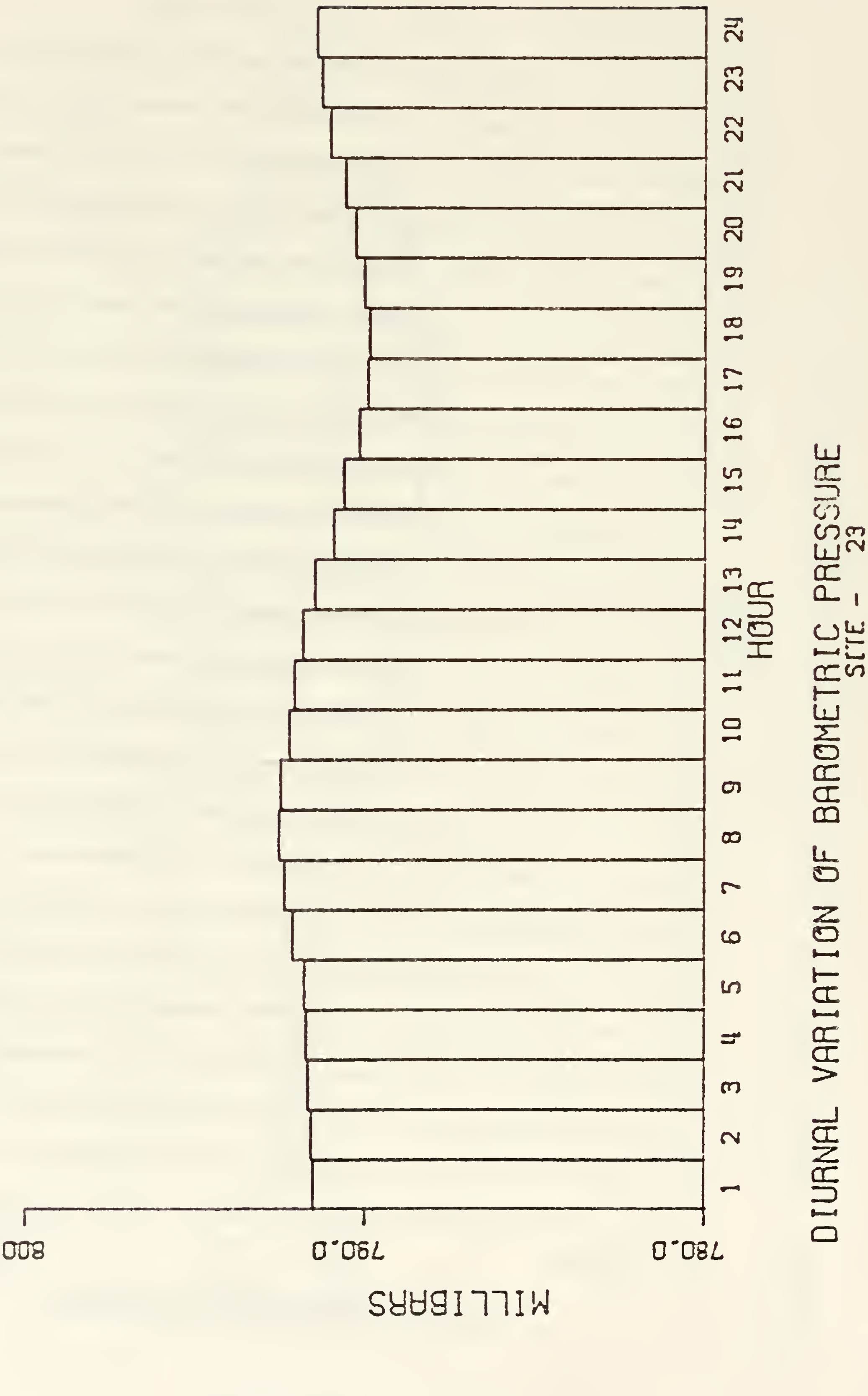
DIURNAL VARIATION OF TEMPERATURE AT 8 FEET (DEG F)
SITE - 23



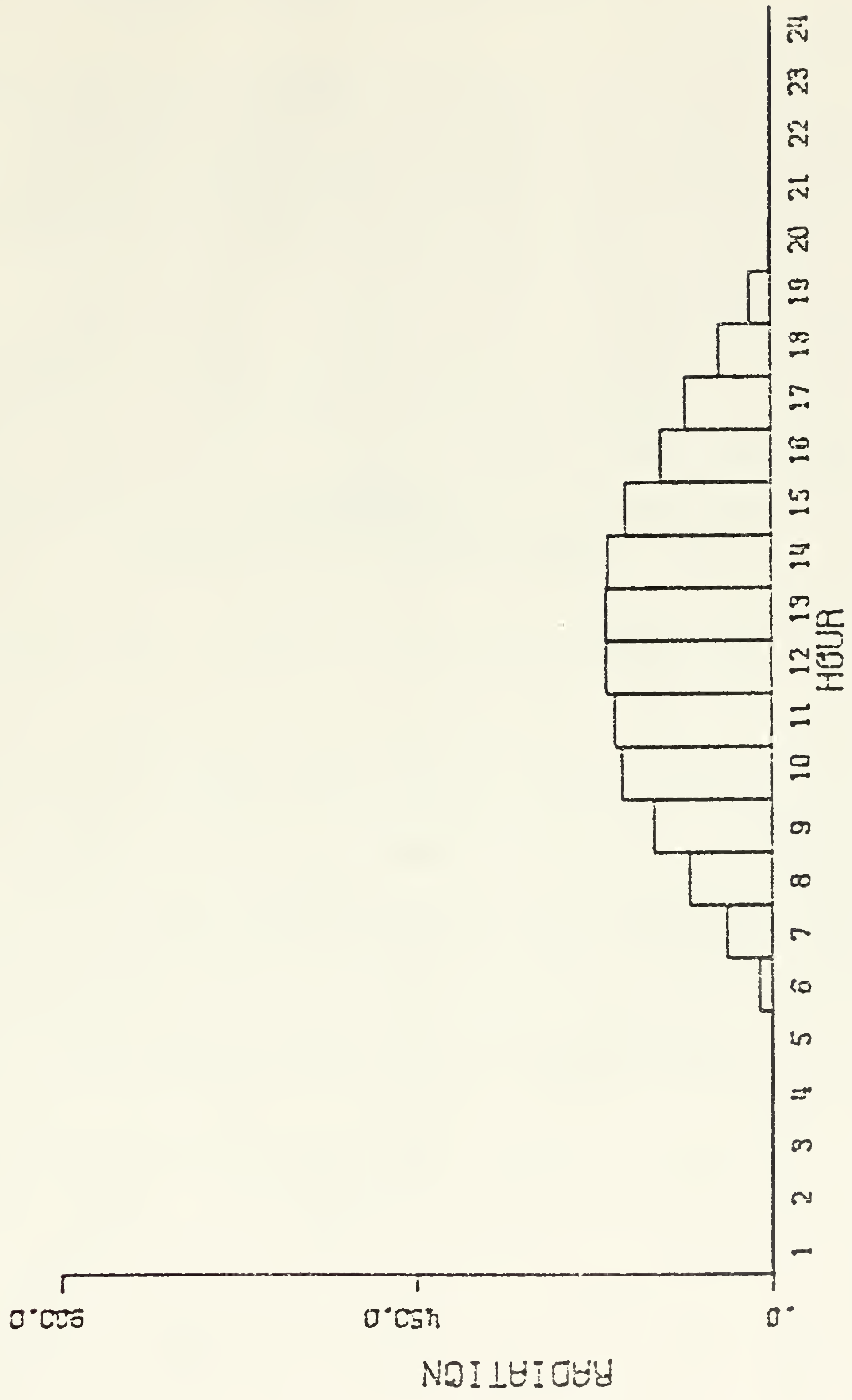
DIURNAL VARIATION OF TEMPERATURE AT 30 FEET(DEG F)
SITE - 23



DIURNAL VARIATION OF TEMPERATURE AT 100 FEET (DEG F)
SITE - 23



DIURNAL VARIATION OF BAROMETRIC PRESSURE
SITE - 23



HOURLY TOTAL SOLAR RADIATION (LANGLEY)
SITE - 23

C-B SHALE OIL PROJECT METEOROLOGICAL TOWER SITE
STABILITY CLASS DETERMINATION USING PYRANOMETER RECORDING
PERIOD(6/ 1/77 TO 6/30/77)

HOUR

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
6/ 1						C	C	C	C	B	B	B	B	B	B		C	C	D					
6/ 2						C	C	B	C	B	B	D	D	D	D	D	D	C	D					
6/ 3						D	C	D	D	B	B	D	B	B	B	C	C	D	D					
6/ 4						C	C	B	C	B	B	B	B	B	B	D	B	D	D	D				
6/ 5						C	D	C	C	B	B	B	B	B	B	B	D	D	D					
6/ 6						D	C	C	C	C	C	C	B	C	D	C	C	D	D					
6/ 7						C	C	B	C	B	C	C	D	C	C	C	D	D	D					
6/ 8						C	C	C	B	C	C	D	D	C	B	B	C	C	D					
6/ 9						C	D	C	D	D	D	D	D	D	D	D	D	D	D	D				
6/10						C	C	B	C	D	D	D	D	D	D	D	D	D	D	D				
6/11						C	C	C	D	D	D	D	D	D	D	D	C	D	D	D				
6/12						C	C	B	C	B	D	D	D	D	D	D	C	C	D					
6/13						C	C	C	C	D	D	D	D	D	D	D	D	D	D					
6/14						C	C	C	D	D	D	D	D	D	D	D	D	D	D	D				
6/15						C	C	C	B	D	D	D	D	D	D	D	D	D	D	D				
6/16						C	C	C	B	B	D	B	D	D	D	D	D	D	D	D				
6/17						C	C	C	C	B	B	D	D	D	D	D	D	D	D	D				
6/18						D	C	B	C	D	D	D	D	D	D	D	D	D	D	D				
6/19						C	C	B	B	D	D	D	D	D	D	D	D	D	D	D				
6/20						C	D	D	D	D	D	D	D	D	D	D	D	D	D	D				
6/21						C	C	C	B	B	B	C	C	B	C	C	D	D	D	D				
6/22						C	C	B	C	B	B	B	C	C	B	C	C	C	D	D				
6/23						C	C	B	B	B	B	B	B	B	B	C	C	D	D					
6/24						C	C	B	C	C	B	B	B	B	D	D	D	D	D	C				
6/25						D	C	B	B	B	B	B	C	B	D	D	D	D						
6/26						C	C	B	B	B	B	B	B	B	C	C	C	D	D	D				
6/27						C	C	C	B	B	C	C	B	D	D	D	D	D	D	D				
6/28						C	C	C	B	B	B	B	B	B	B	B	D	C	D	D				
6/29						C	C	C	B	B	B	B	B	D	D	D	D	D	D	D				
6/30						C	C	C	B	B	B	B	B	D	D	D	D	D	D	D				

* NON-ZERO PYRANOMETER READING BUT STABILITY CLASS UNCERTAIN SINCE NIGHTTIME NET RADIATION INDEX IS REQUIRED

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

APPENDIX A
STABILITY WIND ROSE DIAGRAMS

According to the data presented in AEC Safety Guide No. 23, the relationships between stability classes and σ_Θ are as follows (the values shown are averages for each stability classification...σ_Θ is the standard deviation of horizontal wind direction fluctuations).

Stability Classification	Pasquill Categories	Average Values σ_Θ (degrees)
Extremely Unstable	A	25.0°
Moderately Unstable	B	20.0°
Slightly Unstable	C	15.0°
Neutral	D	10.0°
Slightly Stable	E	5.0°
Moderately Stable	F	2.5°

Stability wind roses obtained at the trailers in the monitoring network are displayed in the following tables. Because of the relatively low heights above the surface (9 meters) at which the wind data is taken, the stability distributions are skewed toward the unstable end of the spectrum. That is, the unstable classes (A, B, and C) have a much higher frequency of occurrence than would be obtained with the Pasquill method of stability categorization (or with instruments at higher levels).

Table 1 depicts the frequency distribution of Pasquill stability categories based on σ_Θ from data collected by M. M. Pendergast and T. V. Crawford at the Savannah River Plant ("Actual Standard Deviations of Vertical and Horizontal Wind Direction Compared to Estimates from Other Measurements", Symposium on Atmospheric Diffusion and Air Pollution, September 9-13, 1974). Three distinct range patterns of stability class distributions were observed: low, mid, and high, according to the height at which the σ_Θ measurements were taken.

TABLE 1

FREQUENCY DISTRIBUTION OF PASQUILL STABILITY CATEGORIES

	Stability Categories based on σ_θ							
Height, m	A $\sigma_\theta > 22$	B $18 \leq \sigma_\theta < 22$	C $13 \leq \sigma_\theta < 18$	D $8 \leq \sigma_\theta < 13$	E $4 \leq \sigma_\theta < 8$	F $2 \leq \sigma_\theta < 4$	G $\sigma_\theta < 2$	
10	22.6	13.9	21.8	23.9	8.9	0.4	3.5	LOW RANGE
25	19.3	11.8	19.4	32.4	15.9	0.7	0.5	
91	9.6	6.7	13.5	21.7	29.6	16.4	2.5	MID RANGE
137	9.3	5.5	11.7	20.8	28.5	18.4	5.5	
182	7.0	2.9	6.8	17.1	25.9	25.5	14.7	HIGH RANGE
243	7.7	4.3	9.4	17.7	27.6	22.9	10.4	
304	7.2	3.7	8.0	17.2	23.7	23.9	11.3	

Also, Figure 1 (from D. H. Slade, Meteorology and Atomic Energy, 1968, p. 52) demonstrates that the line representing very stable conditions (which by their nature are associated with light winds) branches into three separate lines near the ground. The curve at the left represents the smallest values of σ_Θ usually observed. The curve that branches off to the right reflects the contribution of very low-level wind direction meander to the total standard deviation. These meandering oscillations decrease in amplitude very rapidly with height under stable conditions. The central curve represents typical inversion conditions. Actually, for a given stability condition, values of σ_Θ will always be greater when the wind is light than when it is strong. This phenomena is most noticeable in the lowest layers.

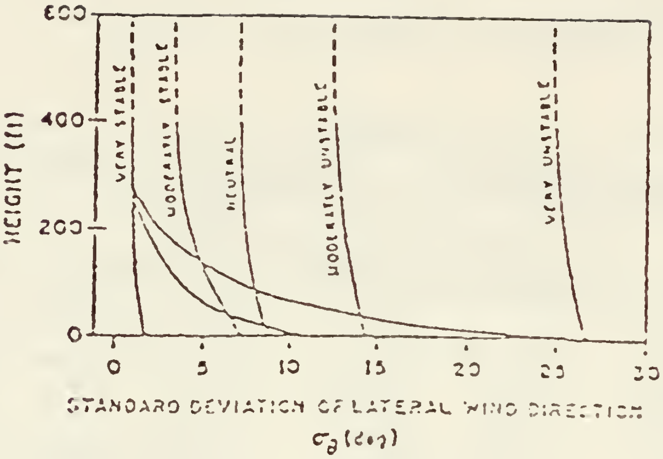


FIGURE 1

The vertical variation of the lateral wind-direction standard deviation (σ_Θ) for various stability regimes. The curves represent average or typical conditions with the exception of the two outer "very stable" lines, which represent extremes.

The large surface values of σ_Θ for unstable conditions do not decrease very rapidly with height. As in the case of very stable conditions, the greatest lateral fluctuations during a very unstable thermal structure occur with very light winds. As a general rule, for a given insolation condition, increasing wind speeds are associated with profiles of σ_Θ that tend toward neutral stability.

The majority of the trailers in the network recorded very light winds throughout the month. Therefore, the stability distributions had a predominance of high σ_Θ values and, hence, unstable classifications. Those trailers with the highest average winds (and fewest nearby obstacles to the flow) generally had the more reasonable and representative low-level stability class distributions.

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                                     STABILITY WIND ROSE DIAGRAM

                                       C-B SHALE OIL PROJECT
                              LEVEL =  8 FEET   PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - A
                                                         WIND DIRECTION
                    N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL   %
GROUP MAX SPEED    10    9    8   12    7    9   11   10   11   16   12   10   11   12   10   10
  MPH

   GT   24   :                                                                                  :        0.

   18 - 24   :                                                                                  :        0.

   12 - 18   :                     1                                  5    1              1        :     8   1.

    7 - 12   :      8    9    1    1    4    7    3    4   13   23   25   13   10    5   11    4  :   141  13.

    3 -  7   :     45   47   32   31   26   20   27   20   14   29   26   27   29   27   36   29  :   465  44.

   LT    3   :     29   37   49   42   27   27   18   18   20   23   20   20   25   28   37   17  :   437  42.

    TOTAL    :     82   93   82   75   57   54   48   42   47   80   72   60   64   61   84   50  ;  1051

   PERCENT   :      8.   9.   8.   7.   5.   5.   5.   4.   4.   8.   7.   6.   6.   6.   8.   5. :        100.
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                  TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        113(  10.75 %)
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                                           STABILITY WIND ROSE DIAGRAM

                                              C-B SHALE OIL PROJECT
                              LEVEL =  8 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - D
                                                              WIND DIRECTION
                           N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW   TOTAL  %
GROUP MAX SPEED           10     9    8    8   10    7    8   10   12   15   20   13   13   13   10   11
     MPH

   GT    24     :                                                                                  :        0.
   18 -  24     :                                                  1                               :     1  0.
   12 -  18     :                                             1   20   30    7    2    2           :    62  9.
    7 -  12     :          9     5    7    4    6    1    1    4   11   57   46   23   18   19   17    9 :   237 35.
    3 -   7     :         16    21   14   12    4    8   13    7   11   18   11   21   13   18   14   15 :   216 31.
   LT     3     :         10    14   13   15   12    7    8    9   15   11   14    9    9    6    8   10 :   170 25.
    TOTAL       :         35    40   34   31   22   16   22   20   38  106  102   60   42   45   39   34 ;   686
   PERCENT      :          5.    6.   5.   5.   3.   2.   3.   3.   6.  15.  15.   9.   6.   7.   6.   5. :      100.
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                     TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          41(   5.98 %)
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                                          STABILITY WIND ROSE DIAGRAM

                                            C-B SHALE OIL PROJECT
                                 LEVEL =  8 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - C
                                                          WIND DIRECTION
                     N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW  TOTAL  %
GROUP MAX SPEED     15    11    13    11    10    11    15    14    17    20    21    18    16    15    16    16
   MPH


   GT   24    :                                                                                                 :       0.

 18 -   24    :                                                             4     4     1                       :    9  1.

 12 -   18    :      8           2                       2     4    22   127   130    42    15    15    14     5 :  386 22.

  7 -   12    :     23    15     9     2     8     6     3    16    45   172   142    39    33    42    55    50 :  658 37.

  3 -    7    :     22    19    17    14    18    25    26    19    28    32    30    24    21    34    28    27 :  384 22.

  LT     3    :     17    20    21    20    32    21    23    24    25    34    23    22     7     6    16    10 :  321 18.

   TOTAL      :     70    54    49    36    58    52    54    63   118   369   329   128    76    97   113    92 ; 1758

  PERCENT     :     4.    3.    3.    2.    3.    3.    3.    4.    7.   21.   19.    7.    4.    6.    6.    5. :      100.
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                         TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        68(   3.87 %)
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CORPORATION

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                              STABILITY WIND ROSE DIAGRAM

                                  C-B SHALE OIL PROJECT
                   LEVEL =  8 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - I
                                                          WIND DIRECTION
                       N   NNE   NE   ENE    E   ESE   SE   SSE    S   SSW   SW   WSW    W   WNW   NW   NNW  TOTAL   %
GROUP MAX SPEED       18    14   14     9   10    10   20    17   20    19   20    18   14    14   15    15
     MPH

   GT    24    :                                                                                           :        0.

   18 -  24    :       1                              1           2     6    4     1                       :    15  1.

   12 -  18    :       2     3    1                   7     5    54   117  127    25    8    12   14     3  :   378 14.

    7 -  12    :      16    10   11     5    4     5   10    32   68   176  136    43   24    25   40    21  :   624 23.

    3 -   7    :      22    25   28    34   36    61   70    85   85   137  206    48   20    24   31    24  :   936 35.

   LT     3    :      14    31   16    38   61    67   66    55   51   121  135    37    9    12   10     7  :   730 27.

    TOTAL      :      55    69   56    75  101   133  154   177  260   557  608   154   61    73   95    55  ; 2683

   PERCENT     :      2.    3.   2.    3.   4.    5.   6.    7.  10.   21.  23.    6.   2.    3.   4.    2.  :     100.
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                    TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -         99(   3.69 %)
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CORPORATION

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                              STABILITY WIND ROSE DIAGRAM

                                 C-B SHALE OIL PROJECT
                   LEVEL =  8 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - F
                                                          WIND DIRECTION
                       N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL   %
GROUP MAX SPEED       18   10     9    7    6    6   18   15   18   19   19   19   17   15   17   15
    MPH


   GT    24    :                                                                                :        0.

   18 -  24    :   1                             1         2    3    3    1                     :   11   0.

   12 -  18    :   8                             1    1   12   36   55   14    5    4   14    6 :  156   7.

    7 -  12    :  20    1    2    1              2    5   43   61   38   17    8   17   27   33 :  275  12.

    3 -   7    :  40   10    5   29   28   51   80   74   80  135  403   51   11   23   50   46 : 1116  47.

   LT     3    :  29   19    7   26   42   48   84   70   56  119  201   30   15   14   16   21 :  797  34.

     TOTAL     :  98   30   14   56   70   99  168  150  193  354  700  113   39   58  107  106 ; 2355

    PERCENT    :  4.   1.   1.   2.   3.   4.   7.   6.   8.  15.  30.   5.   2.   2.   5.   5. :       100.
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                    TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        120(   5.10 %)
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                                        STABILITY WIND ROSE DIAGRAM

                                          C-B SHALE OIL PROJECT
                              LEVEL =  8 FEET   PERIOD( 6/ 1/77 TO   6/30/77)

STABILITY CLASS - TOTAL
                                                               WIND DIRECTION
                      N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED      18   14   14   12   10   11   20   17   26   20   21   19   17   15   17   16
   MPH


  GT   24    :                                                                                 :         0.

  18 -  24   :    2                            2         4   13   12    3                        :    36   0.

  12 -  18   :   18    3    3    1            10   10   89  305  343   88   30   34   42   14 :   990  12.

   7 -  12   :   76   40,  30   11   22   19   19   61  178  489  387  135   93  108  150  117 :  1935  23.

   3 -   7   :  145  122   96  120  112  165  216  205  218  351  676  171   94  126  159  141 :  3117  36.

  LT    3    :   98  120  104  140  176  173  202  180  170  315  409  118   65   66   85   66 :  2487  29.

    TOTAL    :  339  285  233  272  310  357  449  456  659 1473 1827  515  282  334  436  338 ; 8565

   PERCENT   :   4.   3.   3.   3.   4.   4.   5.   5.   8.  17.  21.   6.   3.   4.   5.   4. :       100.
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                         TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        441(    5.15 %)


                                PERCENTAGE OF A      STABILITY -   12.27 %
                                PERCENTAGE OF B      STABILITY -    8.01 %
                                PERCENTAGE OF C      STABILITY -   20.53 %
                                PERCENTAGE OF D      STABILITY -   31.33 %
                                PERCENTAGE OF E      STABILITY -   27.50 %
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                                      STABILITY WIND ROSE DIAGRAM

                                         C-B SHALE OIL PROJECT
                              LEVEL = 30 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

 STABILITY CLASS - A
                                                               WIND DIRECTION
                        N   NNE   NE   ENE    E   ESE   SE   SSE    S   SSW   SW   WSW    W   WNW   NW   NNW  TOTAL   %
GROUP MAX SPEED        11    12   10    17   10    11   13    12   11    16   12    10   11    14   10    12
     MPH


   GT   24     :                                                                                      :           0.

  18 -  24     :                                                                                      :           0.

  12 -  18     :             1          1                1     1          5     2               1          1 :    13   2.

   7 -  12     :        9     4    2     8    4     4    3     4    9    11    14     9    7    12    8     8 :   116  18.

   3 -   7     :       36    31   34    24   24    22   17    22   12    16    13    28   21    28   30    21 :   379  58.

   LT    3     :        7     9   17    20    9     9    5     7    8     9     7     5   10    12    6     3 :   143  22.

    TOTAL      :       52    45   53    53   37    35   26    34   29    41    36    42   38    53   44    33 ;   651

    PERCENT    :        8.    7.   8.    8.   6.    5.   4.    5.   4.    6.    6.    6.   6.    8.   7.    5. :        100.
                    ...................................................................................................

                              TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -           9(   1.38 %)
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                                   STABILITY WIND ROSE DIAGRAM

                                     C-B SHALE OIL PROJECT
                          LEVEL = 30 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - [illegible]
                                                           WIND DIRECTION
                     N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED     10    9   12   12   10   10   14   14   17   20   17   13   15   15   14   13
     MPH


   GT   24   :                                                                                  :      0.

   18 - 24   :                                                2                                  :    2  1.

   12 - 18   :               1    1              2    1    5   14   14    2    5    2    1    1 :   49 13.

    7 - 12   :     4    6    5    3    5    1    2    4    5   19   13    9    0   14   10    6 :  104 27.

    3 -  7   :    12   14   17    9    7   10    5    6   11   15    8   12    5    9   12   19 :  171 45.

   LT    3   :     1    6    3    4    2    5    4    5    2    4    5    5    3    3    1    3 :   56 15.

   TOTAL     :    17   26   24   17   14   16   13   16   23   54   40   28   13   28   24   29 ;  382

   PERCENT   :    4.   7.   6.   4.   4.   4.   3.   4.   6.  14.  10.   7.   3.   7.   6.   8. :     100.
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                    TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          7(   1.83 %)
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                                   STABILITY WIND ROSE DIAGRAM

                                       C-B SHALE OIL PROJECT
                          LEVEL = 30 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

 STABILITY CLASS - C
                                                         WIND DIRECTION
                      N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED      15   12   11   11   14   12   13   13   20   25   21   17   16   20   19   19
     MPH


    GT   24   :                                                    1                                :    1  0.

    16 -  24  :                                               5   16   10             3    1    1 :   36  4.

    12 -  18  :       3    2              1    1    1    2   39  117   85   15   12   13   10    5 :  306 31.

     7 -  12  :      16   13    7    2    7    6   10    7   23   52   39   21   23   23   35   28 :  312 31.

     3 -   7  :      21   21   25   18    7   13   12    8   17   16   17   12   22   20   17   13 :  259 26.

    LT    3   :       5    2    2    1    6    4   11    4    6    7    6    8    6    4    5    2 :   79  8.

     TOTAL    :      45   36   34   21   21   24   34   21   90  209  157   56   63   63   68   49 ;  993

    PERCENT   :      5.   4.   3.   2.   2.   2.   3.   2.   9.  21.  16.   6.   6.   6.   7.   5. :     100.
              ............................................................................................

                       TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -         3(   0.30 %)
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CORPORATION

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                                   STABILITY WIND ROSE DIAGRAM

                                       C-6 SHALE OIL PROJECT
                             LEVEL = 50 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - D
                                                          WIND DIRECTION
                       N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW   TOTAL  %
GROUP MAX SPEED       15    18   18   15   16   21   27   20   24   26   27   21   19   22   17   24
     MPH


   GT   24   :                                        1         1    2    2                        1 :    7  0.

  18 -  24   :              1    1              2    0    3   35   76   53   13    4   11         3 :  202  9.

  12 -  18   :   7     5    2    1    5    3    5   15   96  247  172   52   21   32   32   14 :  709 32.

   7 -  12   :  11    10,  14    6   12   14   17   23   34  144   69   27   18   37   48   30 :  514 23.

   3 -   7   :  37    23   31   38   38   47   43   36   61   96   79   25   15   23   15   28 :  635 29.

   LT    3   :   4     5    6    8   12   11    9   19   20   17   13    7    7    3    3    1 :  145  7.

    TOTAL    :  59    44   54   53   67   77   75   96  247  582  388  124   65  106   98   77 ; 2212

   PERCENT   :   3.    2.   2.   2.   3.   3.   3.   4.  11.  26.  18.   6.   3.   5.   4.   3. :      100.
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                      TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          6(   0.27 %)
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                                  STABILITY WIND ROSE DIAGRAM

                                    C-B SHALE OIL PROJECT
                         LEVEL = 30 FEET   PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - F
                                                         WIND DIRECTION
                         N   NNE   NE   ENE    E   ESE   SE   SSE    S   SSW   SW   WSW    W   WNW   NW   NNW   TOTAL  %
GROUP MAX SPEED         25    13   15    13   16    19   24    23   23    25   24    22   18    22   20    21
     MPH


   GT    24      :       2                                1               2     2                                 :     7  0.

  18 -   24      :       6                           1    4     8   15   53    48    10    1    12    6     6 :   170  4.

  12 -   18      :      19    2.    5     3    4     2   10    31   89  181   116    43   18    48   31    28 :   630 16.

   7 -   12      :      42   11,   10     7   22    36   35   118   88  308.  116    33   20    62   65    54 :  1027 27.

   3 -    7      :      64   30    33    92  153   138  196.  153  126  319   246    39   23    28   41    45 :  1726 45.

   LT     3      :       7    7     9    11   13    25   28    17   48   44    48    12   11     6   11    13 :   310  8.

     TOTAL       :     140   56    57   113  192   202  274   327  366  907   576   137   73   156  154   146 ;  3870

   PERCENT       :      4.    1.    1.    3.   5.    5.   7.    8.   9.  23.   15.    4.   2.    4.   4.    4. :       100.
                 ..................................................................................................

                             TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          13(    0.34 %)
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                              STABILITY WIND ROSE DIAGRAM

                                 C-B SHALE OIL PROJECT
                    LEVEL = 30 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - TOTAL
                                                        WIND DIRECTION
                          N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW  TOTAL   %
GROUP MAX SPEED          25    18    18    17    16    21    27    23    24    26    27    22    19    22    20    24
      MPH


   GT     24     :        2                                   2           1     5     4                                1 :    15  0.

 18 -     24     :        6     1     1                 3     4    11    55   147   111    23     5    26     7    10 :   410  5.

 12 -     18     :       29    10     8     6    10     6    19    50   229   564   389   112    56    96    74    49 :  1707 21.

  7 -     12     :       82    44,   36    26    50    61    67   156   159   534   251    99    68   148   166   126 :  2073 25.

  3 -      7     :      170   119   140   181   229   230   273   225   227   462   363   116    86   108   115   126 :  3170 39.

   LT      3     :       25    30    38    46    43    55 .  59    53    86    84    82    38    38    29    27    23 :   756  9.

    TOTAL        :      314   204   225   259   332   355   424   495   757  1796  1200   388   253   407   389   335 ;  8131

   PERCENT       :       4.    3.    3.    3.    4.    4.    5.    6.    9.   22.   15.    5.    3.    5.    5.    4. :       100.
                     ........................................................................................................

                             TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        38(   0.47 %)


                                  PERCENTAGE OF A      STABILITY -    8.01 %
                                  PERCENTAGE OF B      STABILITY -    4.70 %
                                  PERCENTAGE OF C      STABILITY -   12.21 %
                                  PERCENTAGE OF D      STABILITY -   27.20 %
                                  PERCENTAGE OF E      STABILITY -   47.60 %
```

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL =100 FEET PERIOD(6/ 1/77 TO 6/30/77)

STABILITY CLASS - [illegible]

GROUP MAX SPEED MPH		N 10	NNE 8	NE 11	ENE 19	E 11	ESE 11	SE 9	SSE 10	S 11	SSW 19	SW 12	WSW 12	W 11	WNW 12	NW 16	NNW 10		TOTAL	%
GT 24	:																	:		0.
18 - 24	:				1						1							:	2	0.
12 - 18	:				0						4	2	2		1	1		:	10	2.
7 - 12	:	5	4	1	5	2	7	4	6	9	7	8	4	7	6	8	8	:	97	17.
3 - 7	:	24	20	22	19	21	23	16	15	8	27	18	11	17	15	26	13	:	295	52.
LT 3	:	15	6	10	18	16	11	10	8	14	12	8	2	4	11	11	4	:	160	28.
TOTAL	:	44	30	33	43	39	41	30	31	31	51	36	19	28	33	46	25	;	564	
PERCENT	:	8.	5.	6.	8.	7.	7.	5.	5.	5.	9.	6.	3.	5.	6.	8.	4.	:		100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 15(2.66 %)

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                                  STABILITY WIND ROSE DIAGRAM

                                     C-B SHALE OIL PROJECT
                         LEVEL =100 FEET   PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - [illegible]
                                                       WIND DIRECTION
                       N   NNE   NE   ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW   TOTAL   %
GROUP MAX SPEED       11    13    9     8   11   12   15   11   15   14   14   15    6   15   13    8
      MPH

                                                                                         :        0.
   GT    24    :
                                                                                         :        0.
  18 -   24    :

  12 -   18    :           1                   1    2         6    8    7    3         4    1       :   33  9.

   7 -   12    :   4       2    4     3    6    3    3    7    2   11   10    2         7   20    8  :   92 25

   3 -    7    :  17      12   14    14   12    8    4    9    7   10    6    9    6   14   16    9  :  167 45

   LT     3    :   3       5    1     6    4    8    5    3    4    5    7    5   10    4    4    3  :   77 21

     TOTAL     :  24      20   19    23   22   20   14   19   19   34   30   19   16   29   41   20  ;  369

    PERCENT    :   7.      5.   5.    6.   6.   5.   4.   5.   5.   9.   8.   5.   4.   8.  11.   5.  :      100
               ....................................................................................................

                   TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          5(   1.36 %)
```

STABILITY WIND ROSE DIAGRAM

C-B SHALE OIL PROJECT
LEVEL =100 FEET PERIOD(6/ 1/77 TO 6/30/77)

STABILITY CLASS - [illegible]

GROUP MAX SPEED MPH		N 15	NNE 16	NE 13	ENE 13	E 16	ESE 19	SE 8	SSE 23	S 23	SSW 27	SW 23	WSW 19	W 18	WNW 23	NW 19	NNW 15		TOTAL	%
GT 24	:										3							:	3	0.
18 - 24	:						1		1	7	25	27	1	1	3	1		:	67	8.
12 - 18	:	7	5	2	2	1	1		2	31	67	56	11	11	12	12	12	:	232	27.
7 - 12	:	11	11	6	5	5	3	6	6	16	30	22	20	11	17	17	17	:	203	23.
3 - 7	:	18	19	29	20	11	12	14	13	22	12	16	15	14	16	15	19	:	267	31.
LT 3	:	1	5	7	7	4	5	5	5	5	11	7	9	6	4	6	5	:	92	11.
TOTAL	:	37	40	44	34	21	22	25	27	81	148	128	56	43	54	51	53	;	864	
PERCENT	:	4.	5.	5.	4.	2.	3.	3.	3.	9.	17.	15.	6.	5.	6.	6.	6.	:		100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 6(0.69 %)

```
                              STABILITY WIND ROSE DIAGRAM

                                  C-B SHALE OIL PROJECT
                     LEVEL =100 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - [illegible]
                                                           WIND DIRECTION
                          N   NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL   %
GROUP MAX SPEED          21   21   16   15   16   25   25   22   26   32   26   26   20   22   22   26
     MPH

   GT  24    :                               1                   3   16    8    2                   1 :   31   2.

   18 -  24  :    2    2                     1    3    2   48  152   88   20    5   14    9    4 :  350  17.

   12 -  18  :   11    2    3    3    7    3    6   10   67  200  121   43   23   50   33   20 :  602  30.

    7 -  12  :   21   14   10    6    9   16   19   25   35   81   46   24   30   35   39   41 :  451  22.

    3 -   7  :   24   36   35   30   18   30   27   33   31   39   43   29   24   28   21   17 :  465  23.

   LT   3    :    5    4   12   12   11    8   13   13   13    7   16    8    2    6    5    5 :  140   7.

    TOTAL    :   63   58   60   51   45   59   68   83  197  495  322  126   84  133  107   88 ; 2039

   PERCENT   :    3.   3.   3.   3.   2.   3.   3.   4.  10.  24.  16.   6.   4.   7.   5.   4. :       100.
             ...........................................................................................

                   TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          9(   0.44 %)
```

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```
                              STABILITY WIND ROSE DIAGRAM

                                   C-B SHALE OIL PROJECT
                      LEVEL =100 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

 STABILITY CLASS = 1
                                                        WIND DIRECTION
                        N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED        30   17   21   15   19   22   31   26   28   30   27   25   21   23   24   26
     MPH


  GT   24    :          2                                3    5    8   19   20    5                   1    3 :   66  2.

 18 -  24    :         10         2         2    5    3   10   61  149  111   26    3   21   19    7 :  431 10.

 12 -  18    :         30    8    8    7    9   13   23   81  169  381  142   54   21   41   63   57 : 1107 26.

  7 -  12    :         45   19   19    5   38  139  115  113   97  210  114   54   24   48   67   58 : 1163 28.

  3 -   7    :         46   33   22   41  103  153  170  109   62   78  115   85   47   34   30   39 : 1167 28.

  LT    3    :         14    9   21   19   18   15   28   21   18   18   26   13   15    9   24   18 :  286  7.

   TOTAL     :        147   69   72   72  170  325  342  339  415  855  528  237  110  153  204  182 ; 4220

  PERCENT    :         5.   2.   2.   2.   4.   8.   8.   8.  10.  20.  13.   6.   3.   4.   5.   4. :       100.
                    ..........................................................................................

                            TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -         29(    0.69 %)
```

```
                                     STABILITY WIND ROSE DIAGRAM

                                        C-B SHALE OIL PROJECT
                                LEVEL =100 FEET   PERIOD( 6/ 1/77 TO   6/30/77)

 STABILITY CLASS - TOTAL
                                                           WIND DIRECTION
                          N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW   TOTAL   %
GROUP MAX SPEED          30    21    21    19    19    25    31    26    26    32    27    26    21    23    24    26
      MPH


    GT    24      :       2                             1     5     5    11    38    28     7                 1     4 :   100  1.

    18 -  24      :      12     2     2     1     2     7     6    13   116   327   226    49     9    38    29    11 :   850 11.

    12 -  18      :      48    16    13    12    17    18    31    93   273   660   328   113    55   108   110    89 :  1984 25.

     7 -  12      :      58    50    40    24    60   168   147   159   159   339   200   104    72   113   151   132 :  2006 25.

     3 -   7      :     131   120   122   124   105   226   251   179   130   166   198   147   108   109   108    97 :  2361 29.

    LT     3      :      59    52    53    63    54    48    63    52    56    55    67    59    38    36    51    36 :   782 10.

      TOTAL       :     320   220   230   224   296   468   481   501   745  1585  1047   459   282   404   450   369 ;  8083

    PERCENT       :      4.    3.    3.    3.    4.    6.    6.    6.    9.   20.   13.    6.    3.    5.    6.    5. :       100.
                   ......................................................................................................

                             TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          64(    0.79 %)


                                  PERCENTAGE OF A      STABILITY -    6.98 %
                                  PERCENTAGE OF B      STABILITY -    4.57 %
                                  PERCENTAGE OF C      STABILITY -   10.69 %
                                  PERCENTAGE OF D      STABILITY -   25.23 %
                                  PERCENTAGE OF E      STABILITY -   52.21 %
```

```
                                   STABILITY WIND ROSE DIAGRAM

                                     C-B SHALE OIL PROJECT
                          LEVEL =200 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS -
                                                          WIND DIRECTION
                       N   NNE   NE   ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED       11   10    6    21     9   11    8   11   12   17   13   14   16   12   17   11
      MPH

   GT    24     :                                                                                  :        0.

   18 -  24     :                 1                                                                :     1  0.

   12 -  18     :                 0                             2    2    4    2    1    1    2     :    14  2.

    7 -  12     :  6    8    2    2     1    5    5    6    5    4    5    5    2    6   10    6  :    78 13.

    4 -   7     : 20   24   20   23    12   11   13   19   19   22   16   23   18   19   24   20  :   303 52.

   LT     4     : 12   11   10    9    14   10   15   13   10   10   12   13   11   13   12    8  :   183 32.

      TOTAL     : 38   43   32   35    27   26   33   36   36   38   37   43   32   39   48   34  ;   579

     PERCENT    :  7.   7.   6.   6.    5.   4.   6.   7.   6.   7.   6.   7.   6.   7.   8.   6. :      100.
                ......................................................................................

                   TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        31(   5.35 %)
```

```
                              STABILITY WIND ROSE DIAGRAM

                                 C-B SHALE OIL PROJECT
                        LEVEL =200 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - [illegible]
                                                        WIND DIRECTION
                           N   NNE   NE   ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW  TOTAL  %
GROUP MAX SPEED           10    12    6    7     7   15   13    9   13   19   18   14   15    7   11   15
     MPH


    GT   24     :                                                                                      :        0.

    18 -  24    :                                                      2    1                          :     3  1.

    12 -  18    :                1                     1    1         1    5   11    3    1              2 :    26  8.

     7 -  12    :    4     4     1    3     1    3    5    1    9    4    8    7    5    2   13    8 :    78 25.

     3 -   7    :   11     9    12    6     6    8    9    9    5    6   13    5   14   13    9   16 :   151 48.

     LT   3     :    7     1     1    4     1    5    4    5    4    2    4    4    4    4    3    4 :    57 18.

      TOTAL     :   22    15    14   13     8   17   19   15   19   19   37   19   24   19   25   30 ;   315

      PERCENT   :    7.    5.    4.   4.    3.   5.   6.   5.   6.   6.  12.   6.   6.   6.   8.  10. :      100.
                ......................................................................................................

                        TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -          14(    4.44 %)
```

STABILITY WIND ROSE DIAGRAM

C-b SHALE OIL PROJECT
LEVEL =200 FEET PERIOD(6/ 1/77 TO 6/30/77)

STABILITY CLASS = [illegible]

		WIND DIRECTION																	
GROUP BY SPEED (MPH)		N 18	NNE 15	NE 13	ENE 7	E 12	ESE 17	SE 9	SSE 15	S 24	SSW 27	SW 27	WSW 23	W 22	WNW 18	NW 21	NNW 24	TOTAL	%
GT 24	:									2	1	2					1 :	6	1.
18 - 24	:	1								1	17	14	4	2	1	1	0 :	41	5.
12 - 18	:	6	4	1		2	2		2	11	37	49	19	8	10	7	10 :	168	22.
7 - 12	:	12	10	7	2	7	2	5	11	9	24	22	19	10	13	19	17 :	189	24.
3 - 7	:	22	27	28	23	11	9	18	12	10	20	14	12	12	15	20	22 :	275	36.
LT 3	:	3	5	7	7	3	7	5	2	6	11	8	5	9	7	6	4 :	95	12.
TOTAL	:	44	46	43	32	23	20	28	27	39	110	109	59	41	46	53	54 ;	774	
PERCENT	:	6.	6.	6.	4.	3.	3.	4.	3.	5.	14.	14.	8.	5.	6.	7.	7. :		100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 18(2.33 %)

```
                                    STABILITY WIND ROSE DIAGRAM

                                       C-b SHALE OIL PROJECT
                               LEVEL =200 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - [illegible]
                                                           WIND DIRECTION
                          N   NNE    NE   ENE     E   ESE    SE   SSE     S   SSW    SW   WSW     W   WNW    NW   NNW   TOTAL  %
GROUP MAX SPEED          29    34    14    17    18    17    14    18    25    27    29    29    21    24    21    28
     MPH


   GT   24     :          2     1                                         4    18    22    11           1           1 :    60  3.

  18 -  24     :          2     0                 1                 1    14   110   136    39    13    14    10     5 :   345 17.

  12 -  18     :         17     5     2     5     4     3     3    10    37   160   171    64    27    40    48    35 :   631 31.

   7 -  12     :         18    22     8     6     7    12    20    20    25    57    66    32    32    35    37    33 :   430 21.

   3 -   7     :         17    32    25    16    11    18    35    30    25    42    20    38    44    37    20    20 :   428 21.

   LT    3     :          3     7     6    10     3    12    15     7    13    13    11    12    12    10     8     5 :   147  7.

     TOTAL     :         59    67    39    37    26    45    73    68   118   400   426   196   128   137   123    99 ; 2041

   PERCENT     :         3.    3.    2.    2.    1.    2.    4.    3.    6.   20.   21.   10.    6.    7.    6.    5. :        100.
                   ..........................................................................................................

                             TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -        25(   1.22 %)
```

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STABILITY WIND ROSE DIAGRAM

C-b SHALE OIL PROJECT
LEVEL =200 FEET PERIOD(6/ 1/77 TO 6/30/77)

STABILITY CLASS - [illegible]

	WIND DIRECTION																	
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	%
GROUP MAX SPEED MPH	30	22	25	18	26	24	32	29	31	36	33	28	29	24	23	30		
GT 24 :	5		2			1	7	6	11	40	60	9	4	2		3 :	150	3.
18 - 24 :	10	1	3	1	2	7	7	10	54	184	276	56	10	16	11	11 :	659	15.
12 - 18 :	35	10	15	6	9	23	25	79	91	296	290	85	36	57	93	47 :	1199	28.
7 - 12 :	53	27	20	14	17	57	114	85	77	112	133	56	42	53	82	68 :	1010	24.
3 - 7 :	41	21	10	18	34	112	182	101	51	56	47	72	84	43	29	45 :	946	22.
LT 3 :	17	14	12	11	22	26	43	31	14	21	9	20	26	21	18	19 :	324	8.
TOTAL :	165	73	66	50	84	226	378	312	298	709	815	298	202	192	233	193 ;	4288	
PERCENT :	4.	2.	1.	1.	2.	5.	9.	7.	7.	17.	19.	7.	5.	4.	5.	5. :		100.

TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE - 50(1.17 %)

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                              STABILITY WIND ROSE DIAGRAM

                                 C-b SHALE OIL PROJECT
                        LEVEL =200 FEET  PERIOD( 6/ 1/77 TO  6/30/77)

STABILITY CLASS - TOTAL
                                                          WIND DIRECTION
                        N  NNE   NE  ENE    E  ESE   SE  SSE    S  SSW   SW  WSW    W  WNW   NW  NNW   TOTAL  %
GROUP MAX SPEED        30   34   25   21   20   24   32   29   31   36   33   29   29   24   23   30
   MPH

   GT   24     :        7    1    2              1    7    6   17   59   84   20    4    3          5 :  216  3.

   18 - 24     :       13    1    3    2    3    7    7   11   69  313  427   99   25   31   22   16 : 1049 13.

   12 - 18     :       62   20   16   11   15   29   29   91  142  500  525  173   73  108  150   94 : 2038 25.

    7 - 12     :       93   71   38   27   33   79  149  123  125  201  234  119   91  109  161  132 : 1785 22.

    3 -  7     :      111  113   93   86   74  158  257  171  110  146  110  150  172  127  102  123 : 2103 26.

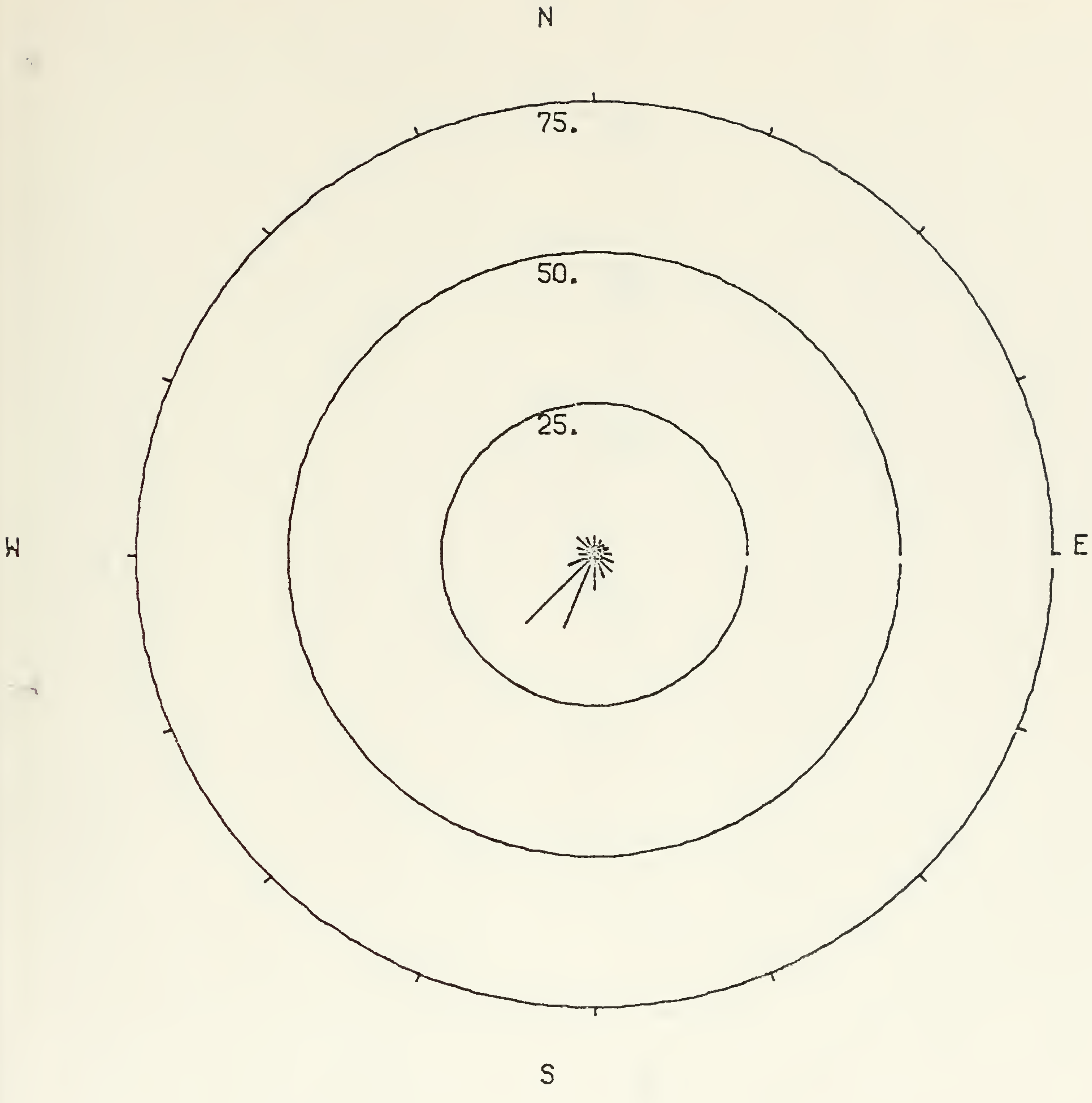
   LT    3     :       43   40   39   41   45   63   86   60   50   58   45   56   64   55   49   41 :  835 10.

     TOTAL     :      329  246  191  167  170  337  535  462  513 1277 1425  617  429  433  484  411 ; 8026

    PERCENT    :       4.   3.   2.   2.   2.   4.   7.   6.   6.  16.  18.   8.   5.   5.   6.   5. :      100.
                   ..........................................................................................

                  TOTAL NUMBER OF CALMS DISTRIBUTED ABOVE -       138(    1.72 %)


                         PERCENTAGE OF A      STABILITY -    7.21 %
                         PERCENTAGE OF B      STABILITY -    3.92 %
                         PERCENTAGE OF C      STABILITY -    9.64 %
                         PERCENTAGE OF D      STABILITY -   25.43 %
                         PERCENTAGE OF E      STABILITY -   55.43 %
```



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 8 FOOT LEVEL

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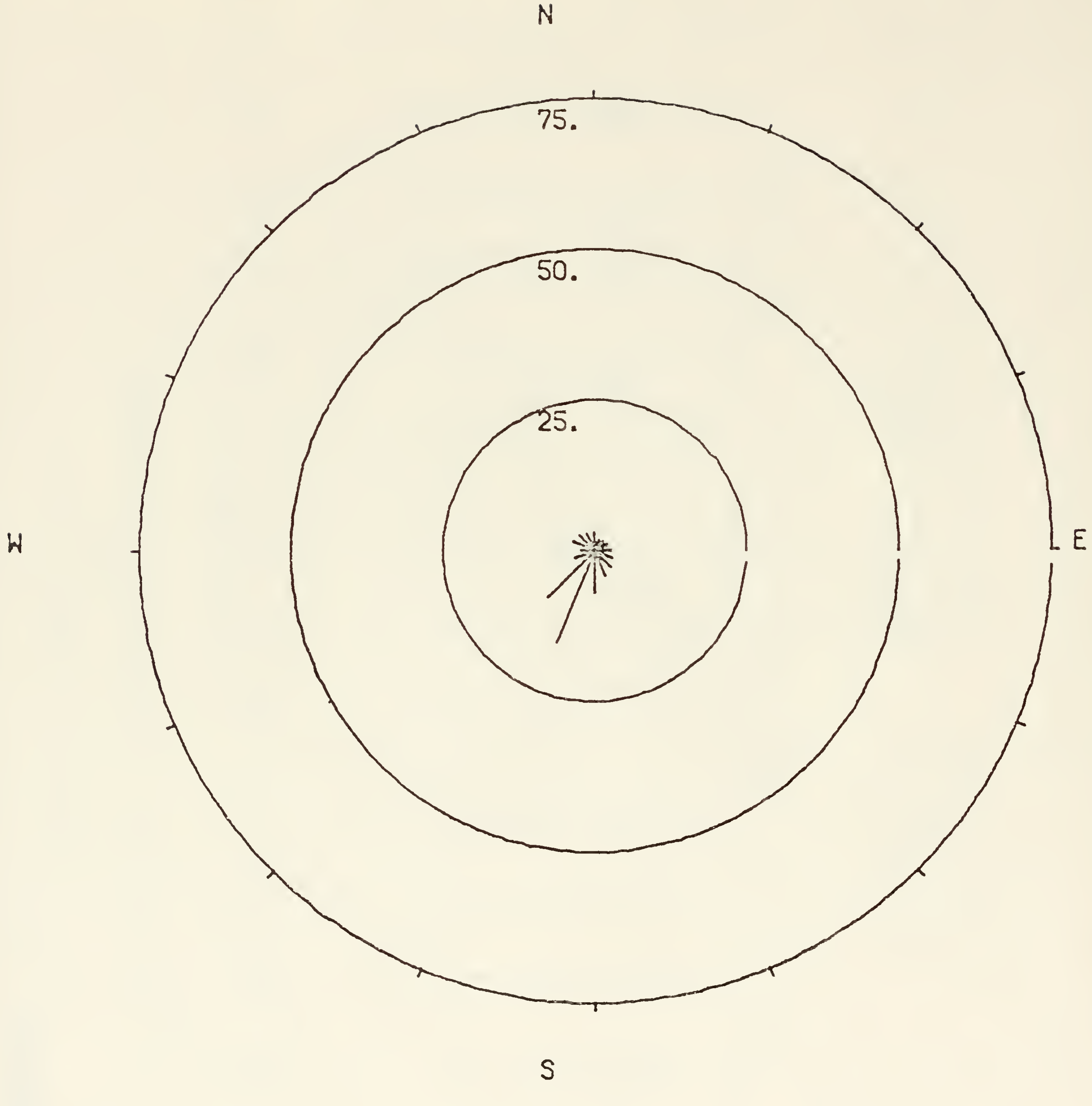
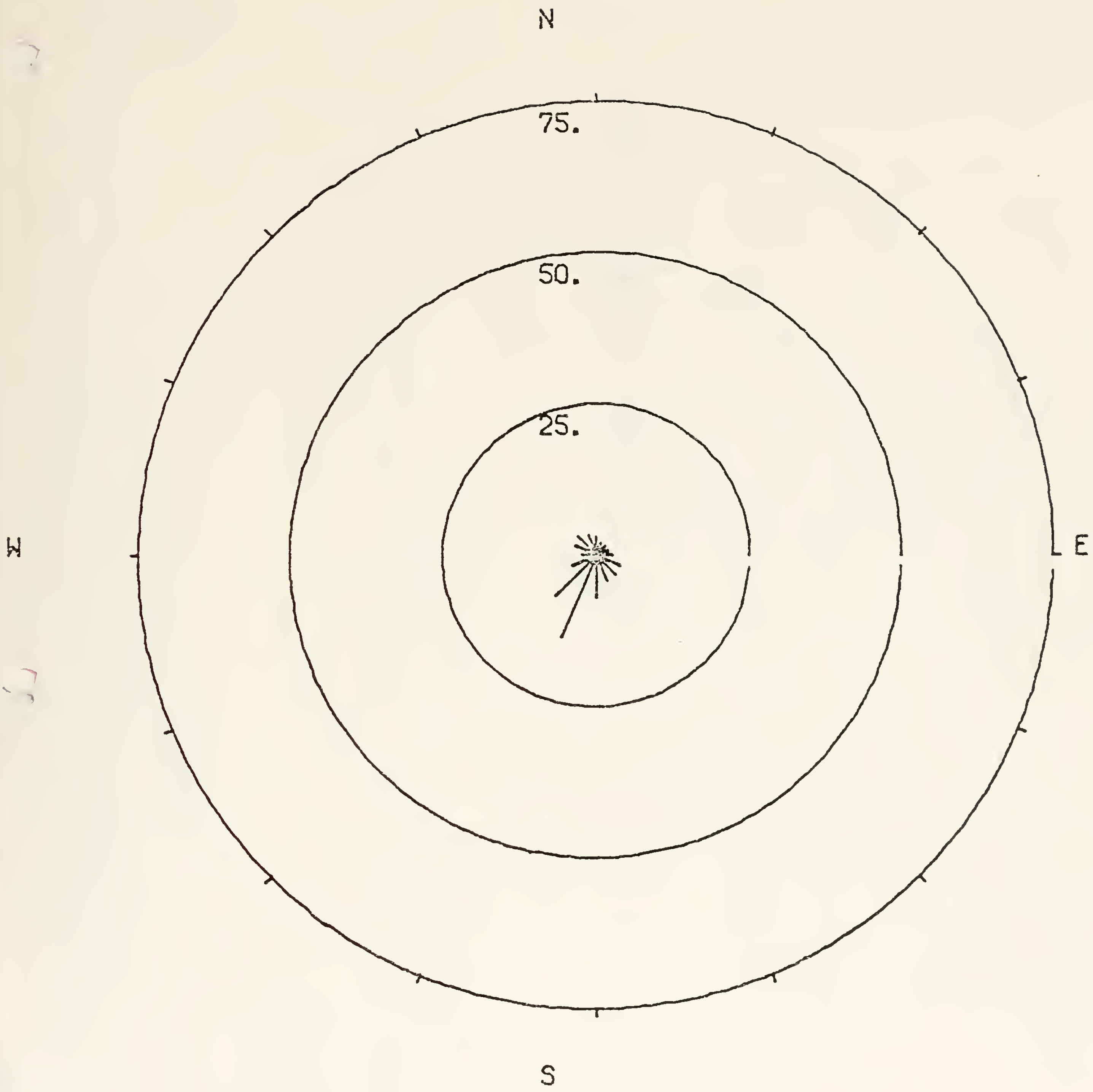
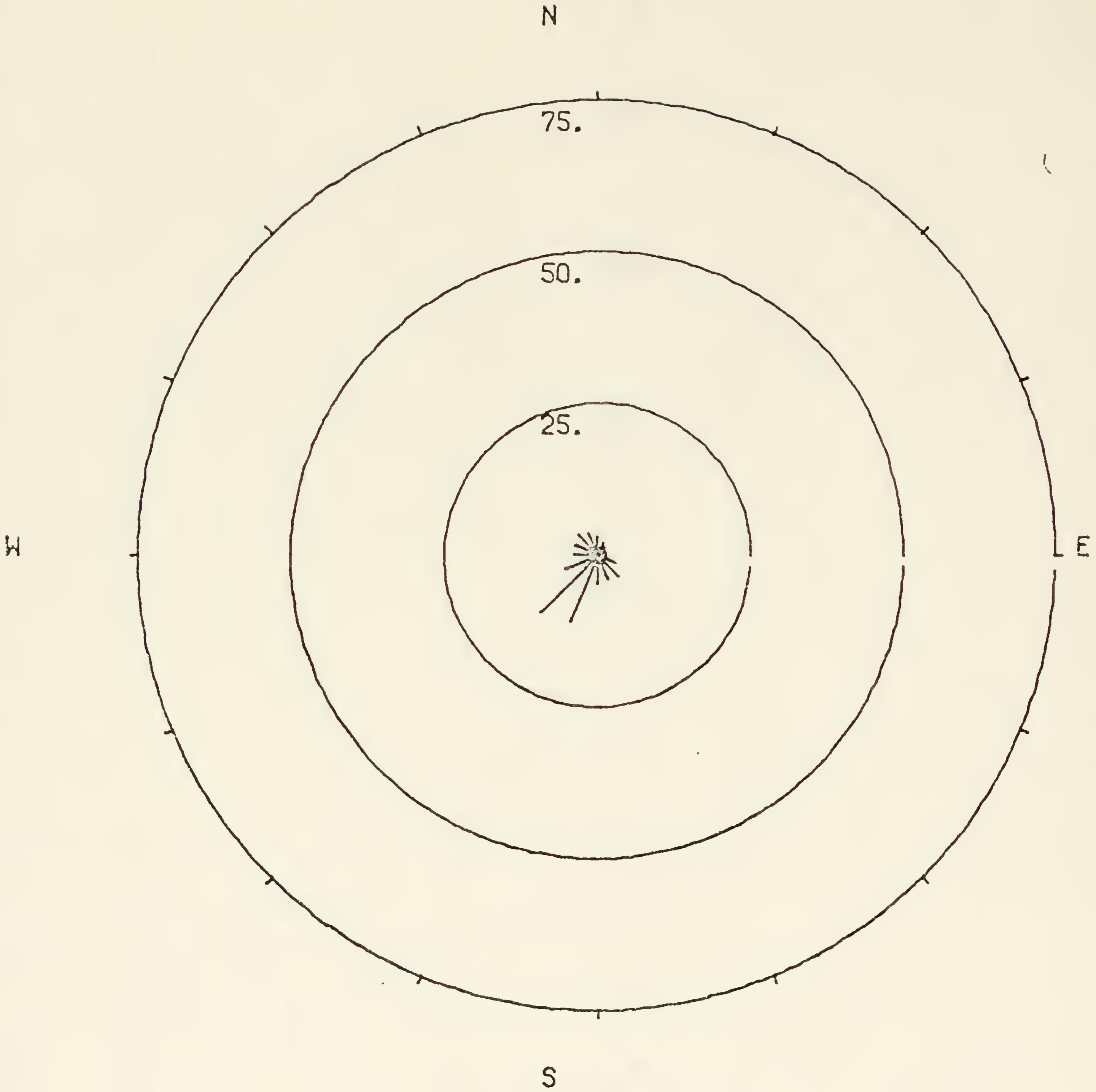


PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 30 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 100 FOOT LEVEL



PERCENTAGE OF OCCURRENCE OF WIND DIRECTION FOR 200 FOOT LEVEL

```
          TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR APR   1-30
                    (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                    WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                SULFUR DIOXIDE(WS: W01
                                  3-HOUR
ITE                  023

1. 4/28( 5:30- 8:30)  12.3( 2:271)
2. 4/27(22:40- 1:40)  11.3( 3:142)
3. 4/12(21:05- 0:05)   2.7( 7:156)
4. 4/13( 0:10- 3:10)   2.5(10:176)
5. 4/ 8( 3:10- 6:10)   2.2( 2:222)
------------------------------------------------------------------------------------------------
```

ADDITIONS TO RADIAN DATA

```
TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR MAY    1-31
               (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
          UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
                 WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                              SULFUR DIOXIDE[WS: WD]
                                 3-HOUR
ITE              023

1. 5/19( 5:45- 8:45)  12.8[ 4:125]
2. 5/18(21:35- 0:35)  10.3[11:194]
3. 5/18(10:05-13:05)   9.7[14:216]
4. 5/20(23:20- 2:20)   4.9[ 3:132]
5. 5/21( 3:07- 6:07)   4.6[ 3:133]
--------------------------------------------------------------------------------
```

```
TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUN    1-30
              (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
         UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
                   WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                               SULFUR DIOXIDE(NS: 401)
                                   3-HOUR
SITE            223

 1. 6/ 3( 9:10-12:10)   6.6(17:220)
 2. 6/ 3(12:15-15:15)   6.5(21:220)
 3. 6/ 3(15:50-18:50)   5.9(12:217)
 4. 6/ 4( 7:45-10:45)   5.6(17:224)
 5. 6/ 4( 0:45- 3:45)   5.3( 4:166)
------------------------------------------------------------------------------------------
```

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                    TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR JUL    1-31
                                 (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                             UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                                    WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                                 SULFUR DIOXIDE(WS: NO)
                                                    3-HOUR
SITE                   023

 1. 7/14(10:10-13:10)    2.5[ 7:359]
 2. 7/13(12:50-15:50)    1.8[ 9:343]
 3. 7/12(16:35-19:35)    1.1[10: 96]
 4. 7/13(16:45-19:45)    1.0[ 7:343]
 5. 7/23(11:10-14:10)     .9[10: 37]
------------------------------------------------------------------------------------------------------------------------
```

```
TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR AUG    1-31
              (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
         UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                 WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                           SULFUR DIOXIDE(MS: 80)
                              3-HOUR
SITE                 423

 1. 8/ 3(10:15-13:15)   2.0(15:197)
 2. 8/ 3(17:25-20:25)   2.0( 6:357)
 3. 8/ 4( 1:45- 4:45)   1.0( 2:154)
 4. 8/ 4( 7:15-10:15)   1.8(17:187)
 5. 8/ 5(18:24-21:24)   1.4( 6:215)
------------------------------------------------------------------------------------------
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              TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR SEP    1-30
                        (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                           UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                                  WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                             SULFUR DIOXIDE(WS: WD)
                                                3-HOUR
ITE                923

1. 9/ 7( 7:35-10:35)   8.6[ 2:161]
2. 9/ 7( 2:05- 5:05)   8.4[ 1:271]
3. 9/29( 3:35- 6:35)   7.4[ 1:154]
4. 9/28(21:15- 0:15)   7.2[ 2:125]
5. 9/29( 6:40- 9:40)   6.8[ 3: 76]
-----------------------------------------------------------------------------------------------------------
```

```
                    TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR OCT    1-31
                              (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                         UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                                WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                                SULFUR DIOXIDE(WS: WD)
                                                   3-HOUR
SITE                023

 1.10/ 8( 5:40- 8:40)   2.7( 2:239)
 2.10/ 6( 1:40- 4:40)   2.5( 4:226)
 3.10/22(10:45-13:45)    .4( 4: 53)
 4.10/21(10:15-13:15)    .2( 4:350)
 5.10/17( 9:10-12:10)    .2( 3:328)
-----------------------------------------------------------------------------------------------------------------
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          TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR NOV    1-30
                        (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
                     UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER: WIND SPEED-MILES PER HOUR:
                            WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                       SULFUR DIOXIDE(WS: W01)
                                          3-HOUR
SITE                 023

1.11/23( 9:30-12:30)  15.9( 3: 37)
2.11/24( 3:25- 6:25)  15.8( 4:151)
3.11/23(23:45- 2:45)  15.8( 1:162)
4.11/24( 6:30- 9:30)  15.7( 3:148)
5.11/23(16:35-19:35)  15.6( 3:214)
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TABLE VI. THE FIVE MAXIMUM INDEPENDENT SLIDING AVERAGES FOR DEC   1-31
          (WITH ASSOCIATED WIND SPEED AND WIND DIRECTION)
               UNITS: CONCENTRATIONS-MICROGRAMS PER CUBIC METER; WIND SPEED-MILES PER HOUR;
                   WIND DIRECTION-DEGREES WITH RESPECT TO THE NORTH

                                     SULFUR DIOXIDE[WS: WD]
                                        3-HOUR
SITE                023

 1.12/ 9( 8:40-11:40)    2.8[15:194]
 2.12/ 2(23:45- 2:45)    2.6[ 4:121]
 3.12/ 3( 6:10- 9:10)    2.5[ 3:100]
 4.12/22( 9:50-12:50)    1.8[ 5: 50]
 5.12/ 7( 9:20-12:20)    1.1[ 4:192]
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BIOLOGY

BIOLOGICAL BASELINE STUDIES

TRACT C-b

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BIOLOGY

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TERRESTRIAL WILDLIFE STUDIES

II C Biology

II C-1 Terrestrial Wildlife Studies

Mammals

Introduction

Data were gathered from November 1, 1976 through September 1, 1977. Discussion of the tabular data contained in this section will be restricted to a brief description of the methods used and to identifying those data which were gathered during two periods: Nov. 1976 - May 1977 and May 1977 - Sep. 1977. These periods will be referred to as the "first" and "second" periods.

Scope of Work

Road counts, shrub production and utilization studies, pellet-group surveys, and age class composition surveys, were conducted for mule deer. Lagamorph pellet counts and small mammal trapping were also conducted during interim monitoring.

Methods

Mule Deer Road Counts

Mule deer road counts were conducted in the same manner as during baseline studies. A 35-mile length of road was driven (from Rio Blanco to Little Hills) and all deer observed were recorded within one-mile intervals. All counts were made during late evenings.

Deer Pellet-group Studies

Deer pellet groups were counted along twelve transects located in two habitat types, pinyon-juniper and chained rangeland. Pellet groups were cleared from the plots during the first period and counts were made during the second period.

Age Class Composition of Deer

Age class estimates of deer were obtained by observations of deer in the agricultural meadows near Piceance Creek during April 1977.

Production and Utilization of Bitterbrush and Mountain Mahogany

Production of these two forage species was estimated by measuring new shoot elongation after the termination of summer growth. Utilization was estimated from measurements of what remained of this growth following winter deer use. Random samples of groups of 10 shoots were taken in the fall and tags were placed below these 10 shoots to permit relocating the same groups in the spring. The fall field effort occurred during the first period; the spring field effort occurred during the second period. Concurrent with studies of shoot lengths, groups of 10 shoots were clipped, dried, and weighed. These data were used to obtain production and utilization by weight.

Lagomorph Pellets

Lagomorph pellet counts were conducted in the same plots which were used for deer pellet counts. Plots were cleared of pellets during the first period, and counts were made during the second period.

Small Mammals

Small mammal trapping and density estimates were conducted in the same manner as baseline studies. All sampling occurred during the second period.

Results

Mule Deer Road Counts

Mule deer road count data is presented in Table II C-1 showing large concentrations of deer near the mouth of Sorghum Gulch.

Mule Deer Pellet-Group Studies

Pellet-group densities are presented in Table II C-2. Densities were the greatest in the chained rangeland particularly Sorghum Gulch.

Age Class Composition

Age class composition data of deer wintering near Tract C-b are presented in Table II C-3.

Shrub Production and Utilization

Production and Utilization of bitterbrush and mountain mahogany in pinyon-juniper and chained rangeland habitats are presented in Tables II C-4 through II C-11. Some of the analyses are uncomplete, therefore final conclusions cannot be drawn at this time.

Lagomorph Pellet Occurrence

Lagomorph pellet occurrence data is presented in Table II C-12. Occurrence is slightly higher in the pinyon-juniper habitat type.

Small Mammals

Density and relative abundance estimates for small mammals are presented in Tables II C-13 and II C-14. Density and abundance are significantly less than previous baseline years.

Table II C-1

Mule Deer Road Counts Conducted from Fall 1976 to Spring 1977

NUMBER OF DEER OBSERVED

Mile Interval	OCT							NOV		DEC		JAN		FEB	MAR		APR			MAY		Mile Interval
	11	12	15	18	20	21	26	11	30	8	15	22	31	24	7	24	6	21	22	5	6	
1 Little Hills																		39	53			1
2																		85	79			2
3									3									111	90			3
4							13		1									59	62	17		4
5				2														47	67			5
6																		143	108	3		6
7																		150	51			7
8																		107	94			8
9 Ryan Gulch					6										5			81	93	2		9
10							4									6		66	66			10
11							16								6			42	17			11
12 Black Sulphur Cr.															15			42	37			12
13			1	23	21	29	3			4		9	3		5			34	88			13
14 Hunter Creek	7	9			89	36	23			7	3							40	130	28		14
15	9			2	9	16	13			4				6	6			63	156	10		15
16 Willow Creek	14		20	32	48	11	26	8	3	4			1					33	112	5		16
17	21	40	13	116	165	165	127	5										69	8			17
18 Sorghum Gulch	15	31	34	253	262	396	327	33										3	24			18
19		10		12	21	12	162	12	7						2			43	11			19
20			8	33	33	46	30	33										19	19			20
21	5	7		10	33		42	98										11				21
22					2	37		2											7			22
23					6	17		4										32	3			23
24							19	33										14	5			24
25 Story Gulch																		20				25
26					4		2	10														26
27							10	4														27
28							15															28
29							12	8														29
30								11														30
31																						31
32																						32
33								1														33
34																						34
35 Rio Blanco																						35
Total No. Observed	71	97	76	483	699	766	844	262	14	19	3	9	4	6	39	6		1403	1380	65	0	

Table II C-2

Deer pellet-group densities, 1977

Transect	Habitat type	Mean pellet-groups per acre + SE	No. of pellet-groups	No. of .01 acre plots
P/J-C-1,2,3	Pinyon-juniper	386+36	221	60
P/J-T-1,2,3	Pinyon-juniper	375+38	225	60
Ch-C-1,2,3	Chained rangeland	638+39	383	60
Ch-T-1,2,3	Chained rangeland	803+73	482	60

Table II C-3

Age Class Composition of Deer wintering near Tract C-b

Date	Fawns	Adults	Fawns / 100 adults
27 April 1977	99	151	65.6

Table C II-4

Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

	A	B	C
	PRODUCTION: length of new shoots in fall (mm)	Length of shoots remaining in spring (mm)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ± SE (N)	$C = \frac{A-B}{A} \times 100$
P/J-C-1	83±7 (100)	33±3 (100)	61
P/J-C-2	105±6 (100)	*	*
P/J-C-3	107±9 (100)	*	*
P/J-T-1	64±5 (100)	*	*
P/J-T-2	115±15 (100)	29±4 (100)	74
P/J-T-3	85±7 (100)	26±3 (100)	69

* analyses incomplete

Table C II-5

Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

Transect	A PRODUCTION: length of new shoots in fall (mm) Mean ± SE (N)	B Length of shoots remaining in spring (mm) Mean ± SE (N)	C UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
Ch-C-1	126±12 (100)	47±5 (100)	62
Ch-C-2	196±23 (100)	65±8 (100)	67
Ch-C-3	113±9 (100)	16±2 (100)	86
Ch-T-1	183±22 (100)	42+4 (100)	77
Ch-T-2	308±29 (100)	56±5 (100)	82
Ch-T-3	274±26 (100)	96±12 (100)	65

Table C II-6

Production and Utilization of Mountain Mahogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

	A	B	C
	PRODUCTION: length of new shoots in fall (mm)	Length of shoots remaining in spring (mm)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ± SE (N)	$C = \frac{A-B}{A} \times 100$
P/J-C-1	51±3 (100)	*	*
P/J-C-2	76±6 (100)	33±5 (90)	56
P/J-C-3	64±6 (100)	21±2 (100)	67
P/J-T-1	57±4 (100)	14±2 (100)	75
P/J-T-2	55±4 (100)	*	*
P/J-T-3	57±3 (100)	*	*

* analyses incomplete

Table C II-7

Production and Utilization of Mountain Mahogany in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on lengths of new shoots.

	A	B	C
	PRODUCTION: length of new shoots in fall (mm)	Length of shoots remaining in spring (mm)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ± SE (N)	$C = \frac{A-B}{A} \times 100$
Ch-C-1	65±3 (100)	20±2 (100)	68
Ch-C-2	78±5 (100)	26±3 (100)	67
Ch-C-3	109±9 (100)	25±3 (90)	77
Ch-T-1	111±13 (100)	34±7 (100)	69
Ch-T-2	91±9 (100)	19±2 (100)	79
Ch-T-3	114±15 (100)	39±5 (90)	66

Table II C-8

Production and Utilization of Bitterbrush in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.

	A	B	C
	PRODUCTION: weight of new shoots in fall (g)	Weight of shoots remaining in spring (g)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ± SE (N)	$C = \frac{A-B}{A} \times 100$
P/J-C-1	.079±.007 (100)	.055±.006 (100)	30
P/J-C-2	*	*	*
P/J-C-3	*	*	*
P/J-T-1	*	*	*
P/J-T-2	.106±.011 (100)	.045±.009 (100)	57
P/J-T-3	.104±.011 (100)	.047±.006 (100)	54

* analyses incomplete

Table II C-9

Production and Utilization of Bitterbrush in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots

	A	B	C
	PRODUCTION: weight of new shoots in fall (g)	Weight of shoots remaining in spring (g)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ±SE (N)	$C = \frac{A-B}{A} \times 100$
Ch-C-1	*	*	*
Ch-C-2	*	*	*
Ch-C-3	.162±.014 (100)	.029±.004 (100)	82
Ch-T-1	*	*	*
Ch-T-2	.383±.039 (100)	.153±.018 (100)	60
Ch-T-3	.373±.040 (99)	.275±.041 (100)	26

* analyses incomplete

Table II C-10

Production and Utilization of Mountain Majogany in the Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.

	A	B	C
	PRODUCTION: weight of new shoots in fall (g)	Weight of shoots remaining in spring (g)	UTILIZATION: in percent
Transect	Mean ± SE (N)	Mean ± SE (N)	$C = \frac{A-B}{A} X 100$
P/J-C-1	*	*	*
P/J-C-2	.187±.022 (100)	.089±.016 (90)	53
P/J-C-3	.125±.009 (100)	.052±.008 (90)	59
P/J-T-1	.144±.018 (100)	.034±.005 (100)	76
P/J-T-2	*	*	*
P/J-T-3	*	*	*

* analyses incomplete

Table II C-11

Production and Utilization of Mountain Mahogany in the Chained Pinyon-juniper Habitat, 1976-77. Estimates are based on weights of new shoots.

Transect	A PRODUCTION: weight of new shoots in fall (g) Mean ± SE (N)	B Weight of shoots remaining in spring (g) Mean ± SE (N)	C UTILIZATION: in percent $C = \frac{A-B}{A} \times 100$
Ch-C-1	.106±.010 (100)	.051±.005 (100)	52
Ch-C-2	*	*	*
Ch-C-3	*	*	*
Ch-T-1	*	*	*
Ch-T-2	.285±.028 (100)	.065±.009 (100)	77
Ch-T-3	.272±.038 (100)	.049±.026 (90)	82

* analyses incomplete

Table II C-12

Occurrence of Lagomorph pellets in .01 acre plots, 1977.

Transect	Habitat type	No. of plots of occurrence	No. of plots of of no occurrence
P/J-C-1,2,3	Pinyon-juniper	50	10
P/J-T-1,2,3	Pinyon-juniper	46	14
Ch-C-1,2,3	Chained rangeland	46	14
Ch-T-1,2,3	Chained rangeland	40	20

Table II C-13

Density and relative abundance estimates of small mammals on Grid 1, chained pinyon-juniper, August 1977.

Scientific name	Common name	Density (animals/ha)	Number of individuals captured	Percent trapping success*
Sciuridae				
Eutamias minimus	Least chipmunk	11.1	37	4.87
Eutamias umbrinus	Uinta chipmunk	-	4	0.53
Heteromyidae				
Perognathus apache	Apache pocket mouse	-	2	0.26
Cricetidae				
Peromyscus maniculatus	Deer mouse	6.6	29	3.82
Peromyscus truci	Pinyon mouse	-	1	0.13
Neotoma cinerea	Bushy-tailed woodrat	-	1	0.13
TOTAL			74	9.74

* No. of individuals captured - 760, the number of trapnights (152 traps set for 5 nights) x 100.

Table II C-14

Density and relative abundance estimates of small mammals on Grid 2, pinyon-juniper woodland, August 1977.

Scientific name	Common name	Density (animals/ha)	Number of individuals captured	Percent trapping success*
Sciuridae				
Eutamias minimus	Least chipmunk	9.2	35	4.61
Eutamias umbrinus	Uinta chipmunk	4.5	17	2.24
Spermophilas lateralis	Golden-mantled ground squirrel	-	1	0.13
Heteromyidae				
Perognathus apache	Apache pocket mouse	-	3	0.39
Cricetidae				
Peromyscus maniculatus	Deer mouse	4.4	13	1.71
Peromyscus truei	Pinyon mouse	-	1	0.13
Neotoma cinerea	Bushy-tailed woodrat	-	2	0.26
Mustelidae				
Mustela frenata	Long-tailed weasel	-	1	0.13
TOTAL			73	9.61

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* No. of individuals captured - 760, the number of trapnights (152 traps set for 5 nights) x 100.

Arthropods

Arthropod studies were discontinued for Interim Monitoring.

Soil Microbiology

Soil microbiology studies were discontinued for Interim Monitoring.

Avifauna

Introduction

Estimates of density, percent relative abundance, and diversity indices were calculated for songbird and songbird-like species for 1977 between January 15 and January 18 and June 7 and June 9. Raptor nest censusing for 1977 was conducted during late April and early June.

Scope of Work

Two transects in chained pinyon-juniper rangeland and two transects in pinyon-juniper woodland were censused in triplicate. One chained pinyon-juniper transect is located near the proposed construction site, the other at a control site which will not be subject to future disturbance. The pinyon-juniper woodland transects are also located in an area near future disturbance and in a control area. Forty raptor nest locations were checked for nesting activity.

Methods

The method employed for censusing was the strip transect method as described by Emlen (1971). This method provides data from which quantitative estimates of density of songbird and songbird-like species can be calculated. Transects are 800 m long and are permanently marked with steel rebar stakes and flagging. The method used for the analysis of quantitative data collected from transects sampled are similar to the analytical methods described in the Sixth Quarterly Report on Inventory of Avifauna at Tract C-b Shale Oil Project (Ecology Consultants, Inc., 1976). Estimates of density, percent relative abundance, and diversity indices were calculated for each census period.

Nests were found using photographs and topographic maps of their locations. Observations were made using a spotting scope from a safe distance (50 meters or more) so as not to disturb possible nesting activity. Any new or undocumented nests were photographed and recorded. Where there was no observed activity, closer examination of the nest was made to look for fresh pellets, whitewash or green material.

Results and Discussion

Tables II C-13 through II C-16 and II C-18 through II C-21 summarize strip transect results and estimates of relative abundance and density for transects censused during January, 1977 and June, 1977, respectively. Table II C-17 (January census) and Table II C-22 (June census) summarize diversity indices calculated for each transect. Where data were insufficient no indices were calculated. The pinyon-juniper woodland transects exhibited higher avian diversity and density values than the chainged pinyon-juniper rangeland transects for both sample periods.

In the April search for early nesting raptors only one nest was active at that time, a great-horned owl nest. There were three active great-horned owl nests the previous year. The remaining nests were checked in April for signs of early nest initiation and courtship: fresh whitewash and green boughs. One nest had green material, and a pair of red-tailed hawks were flying in the vicinity. This nest was later inactive. The weather was extremely windy and somewhat cool at this time, a factor that could possibly have influenced the choice of nest sites in the area.

The June search was made to find activity of later nesters. Neither of the two golden eagle nests active in 1976 were active in 1977. One of the seven previously active red-tailed hawk nests produced young in 1977. A new red-tailed hawk nest was encountered which produced two young. Another new nest was found with common ravens on it. Because of its inaccessibility and demonstrations by the adults, young or eggs were not seen, but were presumed present because of the defense behavior and brooding posture observed over several days.

During Interim Monitoring no active search for additional nests was made, but two new nests were located because they were occupied. One nest was a common raven nest and one was a red-tailed hawk nest. This brings to 40 the number of raptor nests encountered to date.

The total number of active nests for the 1977 Interim Monitoring Period was four.

Nomenclature used in this report follows the American Ornithologists' Union (AOU) Checklist of North American Birds (AOU, 1957) and subsequent revisions (AOU, 1973 and 1976).

TABLE II C-13

Avifauna estimates on transect 1 , Chained pinyon-juniper woodland at Tract C-b for sample period 1 , January 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
COMMON RAVEN	3	*	*	0.05	60.0
TOWNSEND'S SOLITAIRE	1	0.50	*	0.03	40.0
	Total			0.09	

TABLE II C-14

Avifauna estimates on transect 2 , Pinyon-juniper woodland at Tract C-b for sample period 1 , January 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
SCRUB JAY	2	*	*	0.03	10.0
MOUNTAIN CHICKADEE	4	0.50	*	0.14	40.0
PLAIN TITMOUSE	3	0.50	*	0.10	30.0
WHITE-BREASTED NUTHATCH	2	0.50	*	0.07	20.0
	Total			0.34	

TABLE II C-15

Avifauna estimates on transect 3 , Pinyon-juniper woodland at Tract C-b for sample period 1 , January 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
COMMON FLICKER	1	*	*	0.02	3.2
COMMON RAVEN	2	*	*	0.03	6.5
MOUNTAIN CHICKADEE	4	0.17	*	0.41	77.4
WHITE-BREASTED NUTHATCH	2	0.50	*	0.07	12.9
	Total			0.53	

TABLE II C-16

Avifauna estimates on transect 4 , Chained pinyon-juniper woodland at Tract C-b for sample period 1 , January 1977

Species	# Obs	Coeff det	Basal adj	Density /ha.	% Relative abundance
COMMON RAVEN	1	*	*	0.02	100.0
	Total			0.02	

TABLE II C-17

Shannon-Weiner diversity indices (H'), unbiased estimates of H' (E(H')), variance of H' (var(H')), maximum expected value of H' (H'(max)), and equitability (J), for avifauna transects at Tract C-b during sample period 1 , January 1977

Transect	Vegetation type	H'	E(H')	var(H')	H'(max)	J
1	Chained pinyon-juniper woodland	0.673	0.559	0.028	0.693	0.971
2	Pinyon-juniper woodland	1.280	1.199	0.013	1.386	0.923
3	Pinyon-juniper woodland	0.750	0.693	0.030	1.386	0.541
4	Chained pinyon-juniper woodland	0.000	-	-	-	-

- Insufficient data for computation

TABLE II C-18

Avifauna estimates on transect 1 , Chained pinyon-juniper woodland at Tract C-b for sample period 2 , June 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
MOURNING DOVE	2	1.00	*	0.03	2.1
COMMON FLICKER	3	1.00	*	0.05	3.2
HOUSE WREN	1	0.50	*	0.03	2.1
MOUNTAIN BLUEBIRD	3	*	*	0.05	3.2
GREEN-TAILED TOWHEE	22	0.58	*	0.65	40.4
VESPER SPARROW	9	0.56	*	0.27	17.0
CHIPPING SPARROW	1	0.50	*	0.03	2.1
BREWER'S SPARROW	15	0.54	*	0.48	29.8
	Total			1.61	

TABLE C-19

Avifauna estimates on transect 2 , Pinyon-juniper woodland at Tract C-b for sample period 2 , June 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
MOURNING DOVE	4	1.00	*	0.07	1.7
COMMON FLICKER	3	1.00	*	0.05	1.2
HAIRY WOODPECKER	1	0.13	*	0.14	3.3
ASH-THROATED FLYCATCHER	4	0.50	*	0.14	3.3
DUSKY FLYCATCHER	4	0.13	*	0.55	13.2
STELLER'S JAY	1	1.00	*	0.02	0.4
BLACK-BILLED MAGPIE	1	0.50	*	0.03	0.8
MOUNTAIN CHICKADEE	2	0.50	*	0.07	1.7
WHITE-BREASTED NUTHATCH	3	0.19	*	0.27	6.6
HOUSE WREN	4	0.50	*	0.14	3.3
MOUNTAIN BLUEBIRD	2	0.06	*	0.55	13.2
BLUE-GRAY GNATCATCHER	8	0.33	*	0.41	9.9
BACK-TAILED GNATCATCHER	1	0.13	*	0.14	3.3
SOLITARY VIREO	6	0.60	*	0.17	4.1
VIRGINIA'S WARBLER	2	0.50	*	0.07	1.7
BLACK-THROATED GRAY WARBLER	27	0.54	*	0.85	20.7
HOUSE FINCH	2	0.50	*	0.07	1.7
CHIPPING SPARROW	10	0.42	*	0.41	9.9
	Total			4.13	

TABLE II C-20

Avifauna estimates on transect 3 , Pinyon-juniper woodland at Tract C-b for sample period 2 , June 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
MOURNING DOVE	17	1.00	*	0.29	5.9
COMMON NIGHTHAWK	1	0.25	*	0.07	1.4
BROAD-TAILED HUMMINGBIRD	2	0.06	*	0.55	11.0
COMMON FLICKER	3	0.38	*	0.14	2.8
WILLIAMSON'S SAPSUCKER	2	0.25	*	0.14	2.8
HAIRY WOODPECKER	1	0.13	*	0.14	2.8
DUSKY FLYCATCHER	5	0.50	*	0.17	3.4
STELLER'S JAY	3	1.00	*	0.05	1.0
MOUNTAIN CHICKADEE	7	0.22	*	0.55	11.0
WHITE-BREASTED NUTHATCH	12	0.50	*	0.41	8.3
HOUSE WREN	3	0.50	*	0.10	2.1
TOWNSEND'S SOLITAIRE	2	0.50	*	0.07	1.4
MOUNTAIN BLUEBIRD	6	0.38	*	0.27	5.5
SOLITARY VIREO	11	0.55	*	0.34	6.9
WARBLING VIREO	8	1.00	*	0.14	2.8
BLACK-THROATED GRAY WARBLER	18	0.69	*	0.44	9.0
GREEN-TAILED TOWHEE	4	0.25	*	0.27	5.5
GRAY-HEADED JUNCO	4	0.25	*	0.27	5.5
CHIPPING SPARROW	9	0.28	*	0.55	11.0
	Total			4.95	

TABLE II C-21

Avifauna estimates on transect 4 , Chained pinyon-juniper woodland at Tract C-b for sample period 2 , June 1977

Species	# Obs	Coeff det	Basal adj	Density /ha	% Relative abundance
MOURNING DOVE	2	1.00	*	0.03	2.5
COMMON NIGHTHAWK	1	0.50	*	0.03	2.5
COMMON FLICKER	1	1.00	*	0.02	1.3
ROCK WREN	6	0.60	*	0.17	12.7
MOUNTAIN BLUEBIRD	10	*	*	0.17	12.7
GREEN-TAILED TOWHEE	5	0.31	*	0.27	20.3
VESPER SPARROW	7	0.50	*	0.24	17.7
CHIPPING SPARROW	1	0.13	*	0.14	10.1
BREWER'S SPARROW	12	0.75	*	0.27	20.3
	Total			1.35	

TABLE II C-22

Shannon-Weiner diversity indices (H'), unbiased estimates of H' (E(H')), variance of H' (var(H')), maximum expected value of H' (H'(max)), and equitability (J), for avifauna transects at Tract C-b during sample period 2 , June 1977

Transect	Vegetation type	H'	E(H')	var(H')	H'(max)	J
1	Chained pinyon-juniper woodland	1.494	1.454	0.009	2.079	0.718
2	Pinyon-juniper woodland	2.469	2.432	0.003	2.890	0.854
3	Pinyon-juniper woodland	2.740	2.709	0.001	2.944	0.931
4	Chained pinyon-juniper woodland	1.950	1.895	0.004	2.197	0.888

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AQUATIC STUDIES

II C-2 Aquatic Studies

Introduction

Aquatic sampling was reduced in both sampling frequency and locations during Interim Monitoring. This report will not include the fall fish and periphyton sampling, since they have not been completed at this time.

Scope of Study

Collections of periphyton and fish were made twice yearly. Periphyton collections were made during high and low flow at stations P-1, P-5 and P-6. Fish studies were conducted during early July and late October (at the time of this report the October sampling has not been conducted). Sampling stations for fish are: P-1; P-2; P-3 and P-6 for July and S-1, S-2, P-3, and P5-A for October. Benthic invertebrates were collected monthly, by the U. S. Geological Survey (U.S.G.S.) at these six stations: Piceance Creek near Rio Blanco, Willow Creek, Piceance Creek upstream from Hunter Creek, Black Sulfur Creek, Piceance Creek below Ryan Gulch, and Piceance Creek at its confluence with the White River. The location and description for each of the sampling stations for periphyton and fish can be found in Volume IV C-b Final Environmental Baseline Report (QDA, 1977).

Methods

Periphyton

Periphyton were collected on artificial substrate samplers, placed in Piceance Creek for approximately one month. Detailed methods for periphyton collection can be found in the C-b Annual Summary and Trends Report (C-b Oil Shale Venture, 1976). Due to an error in preservation, the method for analysis of biomass was altered from that found in the C-b Annual Summary and Trends Report. The following method was used.

For biomass, each replicate of the formalized samples was analyzed instead of the air dried samples. Each replicate was scraped and suspended in 30 ml of distilled water. After thorough mixing, an aliquot of from 1-6 ml (depending upon cell density) was removed for identification and counting. The remainder of each sample was placed in an ashing dish and oven dried at 105°C. After drying, the sample was weighed and then ashed at 550°C. After ashing, the water of hydration was replaced with distilled water, the sample dried again, and weighed. The ash free dry weight (in grams) was determined by subtracting the ash weight from the oven dry weight.

Air-dried slides were used for qualitative diatom analysis. Slides from each packet were scraped, suspended in distilled water, and used for the preparation of permanent Hyrax slide mounts. The digestion process used involved concentrated H_2SO_4 treatment followed by distilled water rinsing.

Quantitative periphyton data was generated using a WILD M-40 inverted microscope. Aliquots of samples were placed in combined plate chambers, sedimented, and then identified and enumerated using the M-40 scope. A minimum of 100 counts of the dominant organisms was made.

The following counting units were used for enumeration:

Diatoms.	each complete frustule (2 valves)
Unicellular	each cell
Filaments	100 micron length
Discrete colonies	Each 4, 8, 16, 32, 64 celled colony
Indiscrete colonies	Each 8 cells
Dense colonies	Each 50 cells

The following formula was used for calculating absolute density from the count data:

$$\text{Units/mm}^2 = \frac{Ct \times Ac \times Vo}{Ag \times Ng \times Vs \times As}$$

Where Ct = Count in units

Ac = Area of sedimentation chamber (mm^2)

Ag = Area of counting grid (mm^2)

Ng = Number of grids counted

Vo = Original sample volume (ml)

Vs = Sedimentation volume (ml)

As = Area scraped from slide (mm^2)

Identifications were made utilizing standard phycological references.

Benthic Invertebrates

Surber and basket samplers were used by the U.S.G.S. at monthly intervals.

Fish

Electro-shocking and seining were used to collect fish in a sectioned 100 meter skretch of stream. Length, weight and reproductive condition were observed. Detailed methods are outlined in the C-b Annual Summary and Trends Report.

Results and Discussion

Periphyton

Periphyton data for abundance ash-free dry weight are presented in Table II C-23. All samples were dominated by *Navicula viridula* var. *avenacea*. The abundance was greater at station P-1. The ash-free dry weight analysis also showed a higher biomass at station P-1.

Benthos

A limited amount of the benthos data has been reduced (Table II C-24), therefore no discussion of the data will appear in this report.

Fish

Length and weight data for fish are presented in Tables II C-25 through II C-28. No new species of fish were collected compared to previous sampling efforts during the baseline period. More fish were collected (112 mountain suckers) from Station P-3 than had been previously collected (the highest estimate for Mountain Suckers per 100 meter stretch of stream was 68 ± 38) during the baseline period.

Gravid females of both mountain suckers and speckled-dace were collected. Mountain suckers and speckled-dace males in breeding color and condition were also collected. The fish appeared to be healthy and parasite free.

Table II C-23

Abundance (units/mm^2) of periphyton from artificial substrates at Piceance Creek, Colorado on May 18, 1977.

	STATION P-1					STATION P-5					STATION P-6				
	Rep. No.					Rep. No.					Rep. No.				
TAXON	1	2	3	Q	M	1	2	3	Q	M	1	2	3	Q	M
DIVISION BACILLARIOPHYTA (Diatoms)															
Achnanthes lanceolata						P	3	P	--	1	4	--	--	--	1
Achnanthes lanceolata var. dubia	72	30	13	--	38	21	10	13	--	15	18	20	46	--	28
Achnanthes minutissima	26	30	26	--	27	6	14	29	--	16	--	12	15	--	9
Amphora ovalis var. affinis	P	P	P	--	--	P	3	P	--	1	P	2	2	--	1
Amphora perpusilla	--	--	--	--	--	P	--		--	--	--	--	2	--	1
Caloneis amphisbaena	P	P	--	--	--	--	P	P	--	--	P	P	P	--	--
Caloneis ventricosa	--	--	--	--	--	--	--	P	--	--	--	--	--	--	--
Cocconeis pediculus	13	7	19	--	13	6	P	5	--	4	4	5	2	--	4
Cocconeis placentula	P	P	P	--	--	P	--	P	--	--	4	P	P	--	1
Cyclotella meneghiniana	--	--	--	--	--	--	--	P	--	--	7	--	--	--	2
Cymatopleura elliptica	P	--	--	--	--	--	--	--	P	--	--	--	--	--	--
Cymatopleura solea	P	--	6	--	2	P	--	P	--	--	--	P	--	--	--
Cymbella affinis	P	7	P	--	2	P	--	P	--	--	P	2	P	--	1
Cymbella microcephala	--	--	--	P	--	--	--	--	--	--	--	--	--	--	--
Cymbella minuta var. silesiaca	--	P	P	--	--	3	--	P	--	1	--	P	--	--	--
Cymbella sinuata	--	--	--	--	--	--	--	--	P	--	--	--	--	--	--
Cymbella sp.	--	--	--	P	--	--	--	--	--	--	--	--	--	--	--
Denticula tenuis	P	--	--	--	--	--	7	P	--	2	--	--	--	--	--
Diatoma vulgare	P	P	P	--	--	--	--	P	--	--	P	P	P	--	--
Diploneis elliptica	--	--	--	P	--	P	--	--	--	--	--	--	--	--	--
Epithemia sorex	--	--	--	--	--	--	--	--	--	--	--	P	--	--	--
Epithemia sp.	--	--	--	P	--	--	--	--	P	--	--	--	--	P	--
Fragilaria crotonensis	--	--	--	--	--	--	--	--	--	--	--	P	P	--	--
Fragilaria leptostauron	--	--	--	--	--	--	--	P	--	--	P	--	--	--	--
Fragilaria sp.	--	7	--	--	2	--	--	P	--	--	P	P	P	--	--
Gomphonema angustatum	--	--	--	--	--	P	--	--	--	--	4	P	--	--	1
Gomphonema parvulum	13	7	13	--	11	--	7	P	--	2	--	10	P	--	3
Gomophonema truncatum	--	--	--	--	--	--	--	--	--	--	--	--	--	P	--
Gomphonema sp.	6	7	6	--	6	3	P	3	--	2	4	P	P	--	1
Gyrosigma spencerii	P	7	--	--	2	--	--	P	--	--	--	--	P	--	--
Gyrosigma sp.	--	--	--	--	--	--	--	--	--	--	--	--	--	P	--
Hantzschia amphioxys	--	--	--	--	--	--	--	P	--	--	--	--	--	P	--
Merdion circulare	--	--	--	--	--	--	--	--	--	--	P	--	--	--	--
Navicula capitata	--	--	--	--	--	--	--	P	--	--	--	--	--	--	--
Navicula cuspidata	--	--	--	--	--	--	--	P	--	--	--	--	--	--	--

Table II C-23 (continued)

TAXON	STATION P-1 Rep. No. 1	 2	 3	 Q	 M	STATION P-5 Rep. No. 1	 2	 3	 Q	 M	STATION P-6 Rep. No. 1	 2	 3	 Q	 M
Navicula minima	--	--	--	--	--	--	P	--	--	--	--	--	--	--	--
Navicula mutica var. undulata	--	--	--	P	--	--	--	--	--	--	--	--	--	--	--
Navicula pupula	--	P	--	--	--	P	--	3	--	1	--	P	--	--	--
Navicula pupula var. rectangularis	--	--	--	--	--	--	--	--	--	--	--	--	--	P	--
Navicula secreta var. apiculata	32	82	58	--	57	15	38	16	--	23	28	27	2	--	19
Navicula viridula var. avenacea	1061	763	798	--	874	307	509	266	--	361	422	356	400	--	393
Navicula spp.	52	37	19	--	36	12	17	23	--	17	35	22	15	--	24
Neidium sp.	--	--	P	--	--	--	--	--	--	--	--	--	--	--	--
Nitzschia acicularis	--	15	--	--	5	P	7	P	--	2	P	12	2	--	8
Nitzschia amphibia	P	--	P	--	--	9	--	--	--	3	--	--	P	--	--
Nitzschia apiculata	P	--	P	--	--	P	P	P	--	--	--	P	P	--	--
Nitzschia dissipata	--	--	--	--	--	--	--	--	P	--	--	P	--	--	--
Nitzschia hungarica	P	P	--	--	--	P	P	P	--	--	4	P	P	--	1
Nitzschia linearis	52	59	32	--	50	18	28	10	--	19	25	27	19	--	24
Nitzschia palea	26	126	64	--	72	21	10	16	--	16	28	44	22	--	31
Nitzschia tryblionella var. victoriae	--	--	--	--	--	--	P	--	--	--	--	--	--	--	--
Nitzschia spp.	32	15	84	--	44	3	21	13	--	12	11	49	2	--	21
Pinnularia borealis	--	--	--	--	--	--	--	P	--	--	--	--	--	--	--
Pinnularia brebissonii	P	P	P	--	--	--	P	3	--	1	--	P	--	--	--
Pinnularia sp.	P	--	--	--	--	--	--	--	--	--	P	2	P	--	1
Rhoicosphenia curvata	P	--	--	--	--	--	--	P	--	--	--	--	--	--	--
Rhopalodia gibba var. ventricosa	--	--	--	P	--	P	P	--	--	--	--	--	P	--	--
Stauroneis smithii	--	--	--	P	--	--	--	--	--	--	--	--	--	--	--
Surirella ovata	P	15	51	--	22	3	3	3	--	3	7	2	7	--	5
Surirella ovalis	13	22	13	--	16	3	3	--	--	2	4	5	2	--	4
Surirella sp.	6	P	P	--	2	--	--	--	P	--	--	--	--	--	--
Synedra radians	--	--	P	--	--	--	--	--	--	--	--	--	--	--	--
Synedra ulna	--	P	--	--	--	--	3	--	--	1	P	P	--	--	--
Unidentified centric	P	--	6	--	2	--	3	P	--	1	--	--	--	--	--
Unidentified pennate	13	7	19	--	13	3	--	--	--	1	18	5	2	--	8

Table II C-23 (continued)

	STATION P-1					STATION P-5					STATION P-6				
	Rep. No.					Rep. No.					Rep. No.				
TAXON	1	2	3	Q	M	1	2	3	Q	M	1	2	3	Q	M
DIVISION CHLOROPHYTA (Green algae)															
Closterium sp.	P	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ulothrix sp.	6	--	--	--	2	--	--	--	--	--	P	--	--	--	--
DIVISION CYANOPHYTA (Blue-green algae)															
Anabaena sp.	--	--	P	--	--	P	P	--	--	--	P	P	P	--	--
Agmenellum thermale	--	--	--	--	--	--	P	--	--	--	--	--	--	--	--
Oscillatoria sp.	--	--	--	--	--	--	P	--	--	--	P	--	--	--	--
Phormidium sp.	--	--	--	--	--	--	P	P	--	--	--	--	--	--	--
TOTAL	1425	1245	1229		1300	435	684	404		509	624	603	578		602
Ash free dry wt. (gm/cm^2)	.0195	.0114	.0219		.0176	.0005	.0014	.0007		.0009	.0040	.0074	.0090		.0068

P = present

Q = qualitative analysis

M = mean

Table II C-24 *
BENTHIC STUDY
MAY, 1977

Order	Family	Species	Sample Stations**											
			B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	B-11	S-12
Acarina				15		9				18		18		1
Amphipoda		Gammarus lacustris	4		1		3	2	43	1	3		4	
Annelida		Elseniella tetraedra	13	1										
		Limnodrilus sp.								10				
		Tubifex tubifex				4	300	122						2
Coleoptera	Dryopidae	Helichus sp.			1a									
	Dytiscidae	Agabus sp.									1L			
	Elmidae	Optioservus sp.	1L	7a/14L		1L		2L	4a/2L	15a/3L	1L	3a/1L		
	Hydrophilidae	Helophorus sp.									3a			
Diptera	Ceratopogonidea	Palpomuia		24L		10L		6L		19L				
	Chironomidea	Calaspectra sp.					1L	14L						4L
		Cricotopus sp.		9L/2p		53L/5a		20L		17L	4L	12L		
		Diamesa sp.						14L						
		Hydrobaenus sp.		24L		92L/2p		2343L/149p	2L	72L		220L/7p		273L
		Odontomesa sp.		1L				6L						
		Pentaneura sp.	1L		1L		5L			1L		3L/2p		2L
		Polypedilum sp.						14L						
		Procladius sp.		2L		5L	3L	3L						
		Tanutarus sp.				2L	2L	160L						
	Muscidae	Limnophora sp.										1L		
	Simulidae	Simulium sp.				18L		1L						
	Stratiomyliidae	Euparyphus sp.								1L				
	Tipulidae	Dicranota sp.		5L					1L	4L	3L	3L		
		Hexatoma spinosa												9L
		Limnophila sp.						5L				1L		11L
Ephemeroptera	Baetidae	Baetis sp.	2n	22n				65n	3n	47n	1n	16n		10n
		Ephemerella(invaria)	9n	299n			1n	13n	10n	20n	10n	12n		7n
		Tricorythodes fallax		2n				1n	1n	3n	1n	5n		
Hirudinea		Helobdella stagnalis	6				2	1	68	6	4	2		
Mollusca		Physa sp.	1						8		2			
Odonata	Gomphidae	Ophiogomphus severus			2n			1n			2n			
Plecoptera	Perlodidae	Isoperla punctata	33n	145n	1n	3n	8n	8n	143n	69n	88n	109n	3n	9n
Tricoptera	Brachycentrida	Brachycentrus americana							3L					

Table II C-24 (continued)
BENTHIC STUDY
MAY, 1977

Order	Family	Species	B-1	S-2	B-3	S-4	B-5	S-6	B-7	S-8	B-9	S-10	B-11	S-12
Tricoptera(cont'd)	Glassosomatidea	Agapetus sp.		1L										
	Hydropsychidae	Hydropsyche sp.	8L/1p	10L	3L	2L			20L	4L	28L	10L	7L	3L
	Limnephilidae	Limnephilid genus	1L						48L/6p	3L	15L		5L	
		Platycentropus sp.							2L		2L			

* Data compiled by the U.S.G.S.

** Station Locations and Abbreviations

	Depth of water during point velocity reading
B-1, S-2 Piceance Creek below Rio Blanco, #09306007	0.20 ft.
B-3, S-4 Piceance Creek WRC, #09306222	0.40 ft.
B-5, S-6 Black Sulfer Creek, #09306175	0.40 ft.
B-7, S-8 Piceance Creek near Hunter Creek, #09306061	0.35 ft.
B-9, S-10 Piceance Creek below Ryan Creek, #09306200	0.65 ft.
B-11, S-12 Willow Creek, #09306058	0.25 ft.

a - Adult
B - Basket
L - Larvae
n - Nymph
p - Pupa
S - Surber

Page 1 of 2

TABLE II C-25

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-1

Mountain Suckers		Speckled-Dace		Brown Trout	
Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
130	22	65	5	430	1000 (approx.)
111	16	76	7		
120	20	77	8		
117	18	70	15		
133	24	80	8		
115	17	87	8		
111	17	72	6		
111	15	74	6		
135	24	70	7		
120	19	57	4		
122	19	65	5		
83	8	67	5		
82	8	110	16		
87	9	84	9		
121	17	100	14		
81	8	90	10		
85	7	111	14		
89	8	92	10		
88	10	87	10		
89	10	84	6		
168	33	90	10		
118	17	85	9		
153	24	104	15		
166	45	92	11		
161	41	79	6		
131	33	71	4		
149	35	69	5		
147	33	80	7		
128	29	71	6		
150	32	69	5		
159	37	75	7		
134	22	74	7		
130	23				

TABLE II C-25 (continued)

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-1

Mountain Suckers

	Length (mm)	Weight (g)
	140	30
	146	34
	141	28
	154	34
	150	35
	152	38
	120	20
Mean	125.7	23.0
Std. Deviation	25.5	10.5
Std. Error of the mean	4.0	1.7

Total Fish = 40

Speckled-Dace

	Length (mm)	Weight (g)
Mean	80.5	8.3
Std. Deviation	13.2	3.4
Std. Error of the mean	2.3	0.6

Total Fish = 32

Brown Trout

Length (mm)	Weight (g)

Total number of fish collected at P-1 = 73

TABLE II C-26

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-2

	Mountain Suckers	
	Length (mm)	Weight (g)
	141	30
	162	41
	152	38
	167	45
	198	72
Mean	164.0	45.2
Std. Deviation	21.5	16.0
Std. Error of the mean	9.0	7.1

Total Fish = 5

	Brook Trout	
	Length (mm)	Weight (g)
	179	84
	159	49
	179	86
	149	40
	205	113
	200	93
	78	3
	142	38
Mean	161	63.3
Std. Deviation	40.5	36.5
Std. Error of the mean	14.3	12.9

Total Fish = 8

Total number of fish collected at P-2 = 13

TABLE II C-27

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-3

Mountain Suckers		Speckled-Dace	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
130	24	(one individual collected but escaped before being weighed or measured)	
118	16		
84	5		
150	31		
156	37		
135	21		
155	36		
137	24		
84	8		
85	8		
87	9		
75	6		
75	5		
60	2		
75	4		
75	5		
55	3		
69	4		
67	4		
62	3		
66	4		
77	4		
81	6		
74	4		
77	4		
78	3		
75	5		
73	5		
80	6		
60	3		
75	6		
84	6		
71	6		
77	6		
71	4		

TABLE II C-27 (continued)

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-3

Mountain Suckers		Speckled-Dace	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
70	4		
77	5		
80	6		
68	4		
66	3		
68	3		
62	3		
86	6		
75	5		
65	3		
67	4		
87	8		
81	6		
92	9		
72	6		
80	7		
79	7		
77	7		
77	7		
85	7		
80	6		
80	6		
80	6		
83	8		
80	8		
71	6		
74	6		
74	6		
66	5		
79	7		
62	4		
75	6		
110	15		
112	16		
113	16		
75	5		

TABLE II C-27 (continued)

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-3

Mountain Suckers		Speckled-Dace	
Length (mm)	Weight (g)	Length (mm)	Weight (g)
75	5		
80	5		
73	5		
79	6		
83	6		
91	7		
67	4		
65	3		
70	4		
78	5		
81	6		
77	6		
81	6		
75	5		
66	4		
62	4		
77	7		
62	4		
78	6		
68	4		
81	6		
72	5		
83	7		
60	2		
78	6		
116	17		
121	19		
122	19		
134	26		
127	23		
128	24		
108	14		
125	20		
63	2		
69	3		
54	2		

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977

STATION P-3

	Mountain Suckers		Speckled-Dace	
	Length (mm)	Weight (g)	Length (mm)	Weight (g)
	75	4		
	68	4		
	80	5		
	75	5		
	73	5		
Mean	82.9	7.9		
Std. Deviation	21.7	7.0		
Std. Error of the mean	2.1	0.7		

Total Fish = 112

Total number of fish collected at P-3 = 113

TABLE II C-28

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977 - STATION P-6

STATION P-6

Mountain Suckers	
Length (mm)	Weight (g)
80	5
70	5
82	11
74	8
78	8
71	7
70	7
67	6
79	7
80	8
81	8
76	6
67	5
72	7
80	8
83	8
73	7
66	5
58	3
63	4
73	5
74	5
82	6
73	5
79	7
69	5
112	15
138	27
120	20
112	19
117	16
113	15
125	16
122	16
116	16

	Speckled-Dace	
	Length (mm)	Weight (g)
	65	3
	112	14
	73	4
Mean	83.3	7.0
Std. Deviation	25.1	6.1
Std. Error of the mean	14.5	3.5

Total Fish = 3

TABLE II C-28 (continued)

FISH POPULATION SAMPLING OF PICEANCE CREEK, JULY 1977 - STATION P-6

STATION P-6

	Mountain Suckers		Speckled-Dace	
	Length (mm)	Weight (g)	Length (mm)	Weight (g)
	88	7		
	85	7		
	84	7		
	103	12		
	80	6		
	71	4		
	107	13		
	115	16		
	74	5		
	82	6		
	70	5		
	73	5		
	74	5		
	82	6		
	73	5		
	79	7		
	69	5		
	65	4		
	74	5		
	79	7		
	69	4		
Mean	83.8	8.3		
Std. Deviation	18.7	4.9		
Std. error of the mean	2.5	0.7		

Total Fish = 56

Total number of fish collected at P-6 = 59

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Phytoplankton Primary Productivity

No phytoplankton studies were undertaken during Interim Monitoring.

Water Quality

Water quality data for Piceance Creek near Rio Blanco (Table II C-29), above the West Fork of Stewart Gulch (Table II C-30) and above Hunter Creek (Table II C-31) were collected by the U.S.G.S. Tables II C-32 through II C-34 present water quality data for the water year October 1976 to September 1977; this data was also collected by the U.S.G.S.

Sediment

Sediment data was not collected during Interim Monitoring.

Table II. C-29
WATER QUALITY ANALYSIS*
STATION 09306007, 7/12/77 to
PICEANCE CREEK BELOW RIO BLANCO, CO.

Alkalinity, Total (As $CaCO_3$)	MG/L	390	PH Field		8.3
Bicarbonate	MG/L	480	Phosphate Ortho Dissolved as Phosphorous		Determ. Deleted
Calcium Dissolved	MG/L	51	Potassium Dissolved	MG/L	2.2
Carbonate	MG/L	0	Residue Dissolved Calcium Sum	MG/L	664
Chloride Dissolved	MG/L	12	Residue Dissolved Ton/Acre-feet		0.90
Fluoride Dissolved	MG/L	1.2	Sodium Absorption Ratio		3.1
Hardness Noncarbonate	MG/L	0	Silica Dissolved	MG/L	12
Hardness Total	MG/L	330	Sodium Dissolved	MG/L	130
Iron Dissolved	MG/L	30	Sodium Percent		46
Magnesium Dissolved	MG/L	49	Specific Conductance Fld		960
Manganese Dissolved	MG/L	30	Specific Conductance Lab		1020
NO_2+NO_3 as Nitrogen Dissolved	Determination Deleted		Sulfate Dissolved	MG/L	170
Oxygen Dissolved	MG/L	7.0	Water Temp(°C)		25.0

CATIONS

	(MG/L)	(MEQ/L)
Calcium Dissolved	51	2.545
Magnesium Dissolved	49	4.031
Potassium Dissolved	2.2	0.057
Sodium Dissolved	130	5.655
	Total	12.287

ANIONS

	(MG/L)	(MEQ/L)
Bicarbonate	480	7.868
Carbonate	0	0.000
Chloride Dissolved	12	0.339
Fluoride Dissolved	1.2	0.064
Sulfate Dissolved	170	3.540
	Total	11.808

PERCENT DIFFERENCE = 1.99

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* Data compiled by U.S.G.S.

Table II C-30
WATER QUALITY ANALYSIS*
STATION 09306022, 7/12/77
STEWART GULCH ABOVE WEST FORK

Alkalinity, Total (As $CaCO_3$)	MG/L	420
Bicarbonate	MG/L	510
Calcium Dissolved	MG/L	94
Carbonate	MG/L	0
Chloride Dissolved	MG/L	6.9
Fluoride Dissolved	MG/L	0.2
Hardness Noncarbonate	MG/L	140
Hardness Total	MG/L	560
Iron Dissolved	MG/L	130
Magnesium Dissolved	MG/L	79
Manganese	MG/L	50
NO_2+NO_3 as Nitrogen Dissolved	MG/L	1.1
Oxygen Dissolved	MG/L	8.4

PH Field		8.2
Phosphate Ortho Dissolved as Phosphorous	MG/L	0.01
Phosphate Dissolved Ortho	MG/L	0.03
Potassium Dissolved	MG/L	1.2
Residue Dissolved Calcium Sum	MG/L	963
Residue Dissolved Ton/Acre-feet		1.31
Sodium Absorption Ratio		2.4
Silica Dissolved	MG/L	15
Sodium Dissolved	MG/L	130
Sodium Percent		34
Specific Conductance Fld		1290
Specific Conductance Lab		1360
Sulfate Dissolved	MG/L	380
Water Temp (°C)		15.0

CATIONS

	(MG/L)	(MEQ/L)
Calcium Dissolved	94	4.691
Magnesium Dissolved	79	6.499
Potassium Dissolved	1.2	0.031
Sodium Dissolved	130	5.655
Total		16.875

ANIONS

	(MG/L)	(MEQ/L)
Bicarbonate	510	8.359
Carbonate	0	0.000
Chloride Dissolved	6.9	0.195
Fluoride Dissolved	0.2	0.011
Sulfate Dissolved	380	7.912
NO_2+NO_3 as Nitrogen Dissolved	1.1	0.079
Total		16.554

PERCENT DIFFERENCE = 0.96

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* Data compiled by U.S.G.S.

Table II C-31
WATER QUALITY ANALYSIS *
STATION 09306061, 6/20/77 to
PICEANCE CREEK ABOVE HUNTER CREEK

Alkalinity, Total (As $CaCO_3$)	MG/L	440	Molybodenum Dissolved	UG/L	4
Aluminum Dissolved	UG/L	10	Nitrogen NH_4 Dissolved	MG/L	0.01
Arsenic Dissolved	UG/L	3	Nitrogen Dissolved Organic as Nitrogen	MG/L	0.16
Barium Dissolved	UG/L	0	Nitrogen Dissolved Kjeldahl	MG/L	0.17
Bicarbonate	MG/L	540	Nitrogen NH_4 As Nitrogen Dissolved	MG/L	0.01
Boron Dissolved	UG/L	200	NO_2+NO_3 as Nitrogen Dissolved	MG/L	0.03
Bromide	MG/L	0.1	Oil and Grease	MG/L	0.0
Cadmium Dissolved	UG/L	1	Oxygen Dissolved	MG/L	11.7
Calcium Dissolved	MG/L	71	PH Field		8.4
Carbon Dissolved Organic	MG/L	10	Phenols	UG/L	3
Carbon Organic Suspension	MG/L	1.0	Phosphate Ortho Dissolved as Phosphorous	MG/L	0.03
Carbonate	MG/L	0	Phosphate Dissolved Ortho	MG/L	0.09
Chloride Dissolved	MG/L	13	Phosphate Total as PO_4	MG/L	0.03
Chromium Dissolved	UG/L	20	Phosphorous Total as Phosphorous	MG/L	0.01
Chemical Oxygen Demand High Level	MG/L	11	Potassium Dissolved	MG/L	2.7
Color		9	Selenium Dissolved	UG/L	2
Copper Dissolved	UG/L	1	Silica Dissolved	MG/L	15
Cyanide	MG/L	0.00	Sodium Dissolved	MG/L	170
Fluoride Dissolved	MG/L	0.8	Specific Conductance Fld		1310
Iron Dissolved	UG/L	20	Specific Conductance Lab		1280
Lead Dissolved	UG/L	3	Strontium Dissolved	UG/L	2500
Lithium Dissolved	UG/L	8	Sulfate Dissolved	MG/L	330
Magnesium Dissolved	MG/L	71	Sulfide Dissolved		0.5
Manganese Dissolved	UG/L	50	Water Temp (°C)		19.5
Mercury Dissolved	UG/L	0.0	Zinc Dissolved	UG/L	0

* Data compiled by U.S.G.S.

Table II C-31 (continued)
WATER QUALITY ANALYSIS
STATION 09306061, 7/12/77 to
PICEANCE CREEK ABOVE HUNTER CREEK

Alkalinity, Total (As $CaCO_3$)	MG/L	480	Nitrogen Dissolved Kjeldahl	MG/L	0.42
Arsenic Dissolved	UG/L	3	Nitrogen NH_4 As Nitrogen Dissolved	MG/L	0.01
Bicarbonate	MG/L	580	NO_2+NO_3 As Nitrogen Dissolved	MG/L	0.01
Boron Dissolved	UG/L	190	Oxygen Dissolved	MG/L	9.7
Calcium Dissolved	MG/L	80	PH Field		8.2
Carbon Dissolved Organic	MG/L	8.1	Phosphate Ortho Dissolved as Phosphorous	MG/L	0.01
Carbon Organic Suspension	MG/L	0.5	Phosphate Dissolved Ortho	MG/L	0.03
Carbonate	MG/L	0	Phosphate Total As PO_4	MG/L	0.06
Chloride Dissolved	MG/L	12	Phosphorous Total as Phosphorous	MG/L	0.02
Color		5	Potassium Dissolved	MG/L	2.8
Fluoride Dissolved	MG/L	0.7	Silica Dissolved	MG/L	11
Iron Dissolved	UG/L	80	Sodium Dissolved	MG/L	170
Magnesium Dissolved	MG/L	81	Specific Conductance Fld		1370
Manganese Dissolved	UG/L	80	Specific Conductance Lab		1440
Nitrogen NH_4 as NH_4 Dissolved	MG/L	0.01	Sulfate Dissolved	MG/L	350
Nitrogen Dissolved Organic As Nitrogen	MG/L	0.41	Water Temp (^oC)		12.0

CATIONS	(MG/L)	(MEQ/L)	ANIONS	(MG/L)	(MEQ/L)
Calcium Dissolved	80	3.992	Bicarbonate	580	9.507
Magnesium Dissolved	81	6.664	Carbonate	0	0.000
Potassium Dissolved	2.8	0.072	Chloride Dissolved	12	0.339
Sodium Dissolved	170	7.395	Fluoride Dissolved	0.7	0.037
			Sulfate Dissolved	350	7.287
			NO_2+NO_3 As Nitrogen Dissolved	0.01	0.001
	Total	18.122		Total	17.169

Percent Difference= 2.70

Table II C-32
WATER QUALITY DATA STATION NO. 09306058 *
WILLOW CREEK NEAR RIO BLANCO, CO.
WATER YEAR OCTOBER 1976 to SEPTEMBER 1977

Date	Time	Temper-ature (Deg C)	Weather	Surface Area (Square Miles)	Instan-taneous Dis-charge (CFS)	Color (Plat-inum-Cobalt Units)	Spe-cific Con-duct-ance (Micro-mhos)	Dis-solved Oxygen (MG/L)	PH (Units)	Carbon Dioxide (CO2) (MG/L)	Alka-Linity As CACO3 (MG/L)	Bicar-bonate (HCO3) (MG/L)
Oct 16...	0940	6.0	--	48	--	4	1260	9.8	8.1	5.6	359	438
Nov 16...	1200	4.5	--	48	--	3	1100	9.5	8.4	3.0	392	478
Mar 15...	1145	3.0	0	48	--	--	1200	9.5	8.3	4.0	411	501
May 19...	1430	16.0	--	48	0.35	--	1280	8.5	8.4	3.1	390	480

* Data compiled by U.S.G.S.

-- Missing Data

Table II C-33 *

WATER QUALITY DATA STATION NO. 09306022
STEWART GULCH ABOVE WEST FORK, NEAR RIO BLANCO, CO.
WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

Date	Time	Temperature (Deg C)	Weather	Surface Area (Square Miles)	Instantaneous Discharge (CFS)	Color (Platinum-Cobalt Units)	Specific Conductance (Micromhos)	Dissolved Oxygen (MG/L)	PH (Units)	Carbon Dioxide (CO2) (MG/L)	Alka-Linity As CACO3 (MG/L)	Bicarbonate (HCO3) (MG/L)
Oct 5...	1030	8.5	--	43	--	4	1300	10.5	8.4	3.0	381	464
Nov 16...	1000	6.0	--	43	--	4	1300	11.9	8.2	5.1	417	509
Dec 16...	1145	--	--	43	2.3	--	--	--	--	--	--	--
Jan 24...	1215	8.0	1	43	--	5	1330	10.7	8.2	4.6	371	452
Mar 14...	1000	7.5	0	43	--	--	1360	12.1	8.3	4.0	413	503
May 20....	0900	6.5	--	43	--	--	1270	8.2	8.2	4.9	400	490

* Data compiled by U.S.G.S.

-- Missing Data

Table II C-34
WATER QUALITY DATA STATION NO. 09306061 *
PICEANCE CREEK ABOVE HUNTER CREEK, NEAR RIO BLANCO, CO.
WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

Date	Time	Temperature (Deg C)	Weather	Surface Area (Square Miles)	Instantaneous Discharge (CFS)	Color (Platinum-Cobalt Units)	Specific Conductance (Micromhos)	Dissolved Oxygen (MG/L)	Chemical Oxygen Demand (High Level) (MG/L)	PH (Units)	Carbon Dioxide (CO2) (MG/L)	Alkalinity As CACO3 (MG/L)
Oct 6...	1215	9.5	--	309	--	4	1300	11.1	--	8.1	6.2	402
Nov 16...	1450	7.0	--	309	--	3	1390	11.7	--	8.3	4.3	439
Dec 13...	1400	2.5	0	309	--	6	1300	10.5	19	8.1	7.3	470
Jan 25...	1000	0.0	0	309	--	6	1360	11.2	--	8.2	5.5	445
Feb 11...	1140	2.0	0	309	--	8	1280	10.4	--	8.3	4.4	449
Mar 15...	1330	6.5	0	309	--	12	1320	9.2	56	8.2	5.5	447
Apr 14...	1330	16.0	0	309	3.2	7	1520	7.5	--	8.0	11.0	570
May 19...	1245	13.0	--	309	--	12	1300	8.3	--	8.1	7.9	510

* Data compiled by U.S.G.S.

-- Missing Data

Literature Cited: Section II C-2

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TERRESTRIAL
VEGETATION STUDIES

II C-3 Terrestrial Vegetation Studies

Introduction

During the Interim Monitoring period terrestrial vegetation studies were accomplished in the area of herbaceous productivity.

Scope of Study

Six sites were sampled three times during the summer of 1977. These sites are the intensive vegetation study plots located in each of the four major vegetation types. Sampling was conducted in both a fenced and open plot at each site. Ten $1m^2$ quadrats were located and clipped in each fenced and open plot. The clips were separated into the following fractions: *Agropyron smithii*, *Bomus tectorum*, perennial forbs, annual forbs, and half shrubs. Ninety additional $1m^2$ quadrats were located in each plot and estimated by an occular method; clip quadrats were also estimated occularly.

Methods

Herbaceous productivity was measured by the harvest method combined with occular weight estimates. Clipped quadrats were weighed in the field to obtain fresh weight indices to aid occular estimates.

Results and Discussion

The results of fresh weight estimates and oven dried weights of herbaceous standing crop for three periods in 1977 are contained in the following tables.

TABLE II C-35

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977
CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii														1											
Bromus tectorum					<1														3	2					
											<1														
Oryzopsis hymenoides	7	3			6		7	3	2	3	5				3		1								
	3			1	2		3			3	9	3				5			1	<1	1		4	3	
Other Perennial Grasses	3	12	1	8	3	40	2	6	5	6	11	14	12	22	17	13	17	19	10		11	27	10	18	7
	8	37	7	9	15		4	12	1	7	3	7	8	20	18			<1	5	1	8	2	4	15	5
Other Annual Grasses																									
Perennial Forbs	2	8	1	<1	2		6	12	1	4	2		9		1		12	3			2		2	<1	15
	15			2				2			1		1					1		4		<1	3	2	<1
Annual Forbs																									
Half Shrubs																									
Totals	12	23	2	8	11	40	15	21	8	13	18	14	21	23	21	13	30	22	13	2	13	27	12	18	22
	26	37	7	12	17	0	7	14	1	10	13	10	9	20	18	5	0	1	6	5	9	2	11	20	5

TABLE II C-36

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Fenced
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1																								
											2														
Bromus tectorum																									
Oryzopsis hymenoides	<1	2	2	3	1	6			1	3	5	2	3	<1	2			1		3	17		9		
		3		2		2	2			2			1	3	4		5	1		13		2		3	3
Other Perennial Grasses	3	6	5	1	6	12	13	14	3	5	2	7	6	<1	10	11	1	13	<1	15	2	35		1	35
	15	3	3	9	11	14	7	40	22	17	8	5	16	5	4	2		16	11	3	4	6	10	9	10
Other Annual Grasses					1																				
Perennial Forbs	2	1	2	20			10	3	2	10	15	2	4	1			4	12					3	1	
	6		1				3			2	10	13			6				4				5		
Annual Forbs																									
Half Shrubs																									
Totals	5	9	9	24	8	18	23	17	6	18	22	11	13	1	12	11	5	26	<1	18	19	35	12	2	35
	21	6	4	11	11	16	12	40	22	21	20	18	17	8	14	2	5	17	15	16	4	8	15	12	13

TABLE II C -37

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii			3									3		<1										2	1
	1	4	3	1		1	1				4		5	2					1						
Bromus tectorum		3	2	1	1	5	5		<1	5		2	<1				15	1		<1			<1		
											2		<1					3			2				
Oryzopsis hymenoides		3				2					7										1			1	
				1		5	4	4								4									1
Other Perennial Grasses	5	2	7	30	2	5	6	23		9	4	10		15	35	35	5		21		28	4		7	11
	15	5	4	10	25		6	17	4		3	30	7	22	50	26	18	1	15	40	29			30	
Other Annual Grasses																									
Perennial Forbs			2		5		<1		<1	1	2		<1						6	<1	1		<1		
			12			2	2		1	3	4		2	1		<1				<1	2		7		
Annual Forbs			1		2				1	1								<1							
															<1			4			1				
Half Shrubs					5																				
Totals	5	8	15	31	15	12	11	23	1	16	13	15	<1	15	35	35	20	1	27	<1	30	4	<1	10	12
	16	9	19	12	25	8	13	21	5	3	13	30	14	25	50	30	18	8	16	40	34	0	7	30	1

TABLE II C-38

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Fenced
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	1			<1		1				4	2						2		1						<1
						1	20		4	1				6			5		8	1	1			<1	
Bromus tectorum	<1		1	4		2		2		5	1			1		1				<1		1		6	
	<1		<1	<1	1				6	<1	7			3			<1		4				12		10
Oryzopsis hymenoides		1		2		2	4		7		5		4	2		2									
				2					4	5			4	1	1					3		1	4		
Other Perennial Grasses	18	10	3	4	11	17	8		<1	<1	5	33		8	<1	18	6	3	14	7	15	1	8	4	11
	18	6	10	15	5	19	8	12	7	3	5	1	7	5	12	11	4	9	20	10	12	8	6	4	
Other Annual Grasses																									
Perennial Forbs	13	3	5	4	5	1	13		3	3	2		2			64	2	4	17	5	2	5	3	3	3
		25	16	16	24	18	10	10	21	1	5	1	9	3	4		3	10	1	9	13	15	<1	2	<1
Annual Forbs				4																					
				<1	<1	<1											<1			<1					
Half Shrubs		3																			55	46			
																	9								
Totals	32	17	9	18	16	23	25	2	10	12	15	33	6	11	<1	85	10	7	32	12	72	53	11	13	14
	18	31	26	33	30	38	38	22	42	10	17	2	20	18	17	11	21	19	33	23	26	24	22	4	10

TABLE II C-39

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number: 3-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	5	2	2	2	3	1	2	2	2		3	5	2	1	<1	1	1	2		1		1	3		
	<1			2	<1				<1						<1				<1			1		<1	
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	18	16	13	22	11	11	18	16	15	12	14	12	11	14	12	22	6	7	15	11	9	15	11	8	7
	10	12	6	13	10	14	11	9	11	12	13	17	15	16	13	14	12	9	21	12	12	11	8	11	13
Other Annual Grasses																									
Perennial Forbs	9	5	8	6	7	6	6	6	6	8	9	8	11	3	5	4	7	8	4	13	5	7	11	14	6
	8	9	6	10	11	7	5	6	8	6	5	12	9	6	4	13	5	14	10	8	5	10	5	12	6
Annual Forbs							<1			<1						<1									
													<1	<1											
Half Shrubs																									
Totals	32	23	23	30	21	18	26	24	23	20	26	25	24	18	17	27	14	17	19	25	14	23	26	22	13
	18	21	12	25	21	21	16	15	19	18	18	29	24	22	17	27	17	23	31	20	17	21	13	23	19

TABLE II C -40

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number: 3-Fenced
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	8	3	6	2	7	8	5	4	14	18	12	10	3	2	10	7	5	8	11	5	16	6	4	2	5
	9	4	7	12	8	8	11	3	6	17	7	8	4	12	7	2	5	3	5	7	12	9	14	15	4
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	7	10	13	12	12	23	2	12	15	17	17	7	14	12	17	12	16	20	8	20	13	10	13	14	13
	26	11	15	15	21	22	15	8	14	18	12	12	22	7	24	21	22	18	20	18	13	16	18	18	19
Other Annual Grasses																									
Perennial Forbs	6	6	10	5	5	5	10	7	6	9	12	8	6	13	14	3	14	11	23	15	7	6	8	18	10
	5	10	8	20	6	5	7	9	13	12	5	10	15	7	12	18	14	7	8	7	15	12	11	8	7
Annual Forbs					<1			<1	<1	<1			<1							1			<1		
											<1														
Half Shrubs					1																				
Totals	21	19	29	19	25	36	17	23	35	44	41	25	23	27	41	22	35	39	42	41	36	22	25	34	28
	40	25	30	47	35	35	33	20	33	47	24	30	41	26	43	41	41	28	33	32	40	37	43	41	30

TABLE II C-41

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii		6	1		1	2		6	3	2		2	4	2	3		1	<1		1	1	<1	7	<1	
	<1			<1		1				3			2	4		4		<1	5	4	2	3	<1	3	
Bromus tectorum			1																					<1	
Oryzopsis hymenoides			<1	<1							3														
							5																		16
Other Perennial Grasses	2	4	3			15		2	<1			<1	2	2	1	3	4	<1	5	<1		8	<1	1	1
	<1	10		<1						2	<1	1			<1		<1		2		<1			3	
Other Annual Grasses																									
Perennial Forbs								<1																	
																				2					
Annual Forbs	1	1															<1								
					<1					<1							1			<1					<1
Half Shrubs																									
Totals	3	11	5	<1	1	17	0	8	3	2	3	2	6	4	4	3	5	<1	5	1	1	8	7	1	1
	<1	10	0	<1	<1	1	5	0	0	5	<1	1	2	4	<1	4	1	<1	7	6	2	3	<1	6	16

TABLE II C-42

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4-Fenced
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii		<1	1	4	<1	1	1	<1		4	1	1			1		<1					<1	<1	3	
			1	<1	<1		2	2					3	1	1	3			1			1		1	
Bromus tectorum															<1										
Oryzopsis hymenoides		3						2	3				5	8					<1		<1				6
		12		7	3										<1			4					2		
Other Perennial Grasses			2	<1		<1		<1				3					4	4	1			1	1	1	1
			<1			1	3		3		<1	2	<1	2			10	1							1
Other Annual Grasses			2																						
Perennial Forbs	<1			1			<1			<1							3			1					<1
																		2							
Annual Forbs								1	2						1					<1	4	<1			
								<1					1												
Half Shrubs																									
Totals	<1	3	5	5	1	1	1	3	5	4	1	4	5	8	2	0	7	4	1	1	4	1	1	4	7
	0	12	1	7	3	1	5	2	3	0	<1	2	4	3	1	3	10	7	1	0	0	1	2	1	1

TABLE II C-43

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 5-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	1																								
Bromus tectorum																									
Oryzopsis hymenoides		35			3	1	13	3	1	4	2	6	5			10	9		7	2		<1			
		3			2	5	<1	1	<1					10	<1		4	11		4	5	3	1	2	9
Other Perennial Grasses	2	10	1	33	4	2	17	3	1	<1	<1		3	6	13			<1	<1	5	2			10	1
	<1	3	2	<1	<1	2	5	<1	3	<1	2	<1	1			<1	1			1		<1	1	<1	2
Other Annual Grasses																									
												4													
Perennial Forbs				17			40															<1			
					1										<1				5						
Annual Forbs																									
Half Shrubs																									
Totals	3	45	1	50	7	3	70	6	2	4	2	6	8	6	13	10	9	<1	7	7	2	<1	0	10	1
	<1	6	2	<1	3	7	5	1	3	<1	2	4	1	10	<1	<1	5	11	5	5	5	3	2	2	11

TABLE II C-44

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977
PINYON-JUNIPER WOODLAND

Plot Number: 5-Fenced
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	10	2		1			<1				2						<1	1	7		2	2		1	
	<1			2						<1					7			<1				1	<1		1
Bromus tectorum																									
Oryzopsis hymenoides	6		10	8	2	8	7	7			12			1		11				2	4	1	3	<1	
			2	<1	7	9		2	1	1	2				1	4	2							<1	<1
Other Perennial Grasses		16				4	5		20	6	8	6	<1	10	1	8	12	12	8	1	10	8	5	6	8
	9		2	5			2	3	4		9	2	<1	8	10	3		<1	6	<1	3	8	<1	10	2
Other Annual Grasses																									
Perennial Forbs		4		1		4	3	9	10	2	1	2		4				1				2			4
	1					4			3	1	<1			3	4		3		3		2			8	3
Annual Forbs																			1						
			<1																						
Half Shrubs																									
Totals	16	22	10	10	2	16	15	16	30	8	23	8	<1	15	1	19	12	14	16	3	16	13	8	7	12
	10	0	4	7	7	13	2	5	8	2	11	2	<1	11	22	7	5	<1	9	<1	5	9	<1	18	6

TABLE II C-45

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 6-Open
Clipping Period: Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1		12	2	3	<1		<1	<1		1	54	9		1					<1					
	<1							1				<1		<1	<1		<1				2	<1	1		
Bromus tectorum																									
Oryzopsis hymenoides																			4						
Other Perennial Grasses	15	11	19	2	11	7	12	22	30	10	13		4	11	10	3	24	21		7	8	7	9	7	30
	20	4	<1	17	8	7		11				7	7	4	11	12	23	11	12	6	5	14	18	12	12
Other Annual Grasses																									
Perennial Forbs	3	1	3	<1		3		8	2		2	6	20	9	<1	1	12	<1		3					12
	<1			18	15	<1		<1				<1	2	13	<1	15	4	35	8		2	11	7	<1	30
Annual Forbs																									
Half Shrubs																									
Totals	18	12	34	4	14	10	12	30	32	10	16	60	33	20	11	4	36	21	4	10	8	7	9	7	30
	20	4	<1	35	23	7	0	12	0	0	0	7	9	17	11	27	27	46	20	6	9	25	25	12	42

TABLE II C-46

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number : 6-Fenced
Clipping Period : Late May

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii								<1								1					1				
																				<1	<1	<1	<1	<1	1
Bromus tectorum																									
Oryzopsis hymenoides		4			2	6			<1	<1						1								2	
		3											3	2											
Other Perennial Grasses	9	3	4	8	4		7	8	4	5	<1		4	11	7	<1	2	1	9	12	4	6	7	1	7
	2	3	3	4	<1	<1	<1	5	8	20	1	11	6	4	12	3	5	9	5	3	2	<1	5	6	10
Other Annual Grasses																									
Perennial Forbs		3		<1	2		<1	<1		1					5	25	13		<1	7		1	1	1	<1
	2			<1					<1	2		<1	<1		1	<1							2	3	
Annual Forbs																									
Half Shrubs																									
Totals	9	10	4	8	8	6	7	8	4	5	<1	0	4	11	12	27	15	1	9	19	5	7	8	4	7
	4	6	3	4	<1	<1	<1	5	8	22	1	11	9	6	13	3	5	9	5	3	2	<1	7	9	11

TABLE II C-47

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii					<1															2					
																<1		15			<1				
Bromus tectorum																									
Oryzopsis hymenoides	2	<1			10	<1			<1		1									2			<1		
			1							2			2						1			<1		<1	1
Other Perennial Grasses	3		20	12			8	1	8	1	20	2	18	1	1	9	18	6	6	7	15	8	4	9	2
	15	12	2	<1	4	1	4	10	15	2	6	<1	3	20	<1	10	6		2	16	14	1	1	7	6
Other Annual Grasses																									
Perennial Forbs											4					3		3		8	1				
			5			2	<1		1								1	1						1	
Annual Forbs																									
Half Shrubs											3														
																	4				5				
Totals	5	<1	20	12	10	<1	8	1	8	1	28	2	18	1	1	12	18	9	6	19	16	8	4	9	2
	15	12	8	<1	4	3	4	10	16	4	6	<1	5	20	<1	10	11	16	3	16	19	1	1	8	7

TABLE II C-48

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Fenced
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	2	<1	<1		<1	1		5	1	<1				5											
	1	10						8	11	4			1												
Bromus tectorum	<1																								
Oryzopsis hymenoides				3	<1	2	3		<1		3	4		3	3								2		
	1					3		<1		3		1				3	1		7						
Other Perennial Grasses	<1	9	9	<1	3	8	1	2	2	6	13	10	10	6	3	11	9	16	5	15	20	18	2		
	5	2		70	40	12	1		3	2	6	7	8	20	40	10	5			6	5	4	3	13	2
Other Annual Grasses																									
Perennial Forbs	1			1				3	2	11									<1				15		
	3																1							<1	
Annual Forbs																									
Half Shrubs			5		5					3				9									10		
		7	3								2														
Totals	3	9	14	4	8	11	4	10	5	20	16	14	10	23	6	11	9	16	5	15	20	18	29	0	0
	10	19	3	70	40	15	1	8	14	9	8	8	9	20	40	13	7	0	7	6	5	4	3	13	2

TABLE II C-49

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii																									
		<1					3						<1		1		1	5	5					15	
Bromus tectorum								<1																	
																							<1		
Oryzopsis hymenoides																					2				
		4																							
Other Perennial Grasses	6			10	6	12	2	9	3	4	8	3		3	3		3	2	17	1	4	7	4	<1	
	5	12	5	1	10	35	7	15	10	7	17	5	6	4	4		3	6		5	26	13	5	2	11
Other Annual Grasses																									
Perennial Forbs						<1			2								<1	<1		12	<1		2		<1
								6				<1				20			20				25	3	
Annual Forbs		1														<1							2	<1	
																<1							4		
Half Shrubs																									
																					3				
Totals	6	1	0	10	6	12	2	9	5	4	8	3	0	3	3	<1	3	2	17	13	6	7	8	<1	<1
	5	16	5	1	10	35	10	21	10	7	17	5	6	4	5	20	4	11	25	5	29	13	34	20	11

TABLE II C-50

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Fenced
Clipping Period : Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	1	6				1	6						<1				5					5	<1		1
							1			<1					<1									1	
Bromus tectorum																									
Oryzopsis hymenoides		3	10					5		7	1			4							7			1	
								1						2							3				
Other Perennial Grasses	2	4		<1	<1		5				6	6	6	1			2	<1	6	3	5	<1	1	11	6
	5	1	1	5	3	2	1		2	3	2	2		7	1	4	1	1		18	2	<1			<1
Other Annual Grasses																									
Perennial Forbs						20	<1	3	1			4	<1	1			<1		3	14		11	11		
	3	5					2							1		1	<1	4	2				4	1	
Annual Forbs			<1				<1							<1											
Half Shrubs		4																							
Totals	3	17	10	<1	<1	21	11	8	1	7	7	10	6	6	0	0	7	<1	9	17	12	16	12	12	7
	8	6	1	5	3	2	4	1	2	3	2	2	0	10	1	5	1	5	2	18	5	<1	4	2	<1

TABLE II C-51

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number: 3-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1	2	3	3	4	3	2	2	2	4	3	8	4	2	3	2	3	3	5	4	4	2	2	3	4
	5	6	2	4	3	4	5	4	6	3	3	4	5	<1	5	5	11	2	4	6	4	4	4	5	11
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	6	8	3	10	4	3	12	3	4	2	3	2	4	2	6	1	2	3	1	3	1	7	1	3	2
	3	4	6	3	5	3	8	3	3	5	4	3	6	6	6	2	3	4	10	7	3	4	9	4	5
Other Annual Grasses																									
Perennial Forbs	1	<1	1	2	1	1	1	<1	<1	2	1	<1	1	<1		2	3	3	1	1	3	2	<1	2	2
	<1	<1	1	2	1	<1	2	<1	2	1		5	1	4	3	1	5	2	3	2	6	3	<1	<1	1
Annual Forbs																									
Half Shrubs																					<1				
	2														3						1				
Totals	7	10	7	15	9	7	15	5	6	8	7	10	9	4	9	5	8	9	7	8	8	11	3	8	8
	10	10	9	9	9	7	15	7	11	9	7	12	12	10	17	8	19	8	17	15	14	11	13	9	17

TABLE II C-52

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number: 3-Fenced
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	3	2	8	6	8	4		6	6	6	6	5	2	<1	10	3	2	6	8	6	4	5	3	3	3
	4	4	2	2	1		4	4	1	3	2	4	8	3	3	3	5	5	4	2	7	2	6	4	4
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	4	8	5	7	3	2	4	8	3	6	5	6	2	10	15	8	7	7	5	5	4	4	3	3	6
	6	12	4	7	5	4	4	5	3	7	4	5	5	4	3	4	4	4	4	4	6	4	6	5	5
Other Annual Grasses																									
Perennial Forbs		2			1			3	<1	<1	2	1		1		2		1	2	3	4	2	3	3	1
	1	2	2	4	1	4	1	2	3	1	5	2		3	2	3	3	6	3	3	2	8	2	2	3
Annual Forbs																									
Half Shrubs																				2					
												2					3			3				6	
Totals	7	12	13	13	12	6	4	17	9	12	13	12	4	11	25	13	9	14	15	16	12	11	9	9	10
	11	18	8	13	7	8	9	11	9	11	11	13	13	10	8	10	15	15	11	12	15	14	14	17	12

TABLE II C-53

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1		<1	1	<1	<1		<1		<1	1	<1	<1		<1	2		2					1		
	1		<1	1	<1			<1	<1		<1	<1									<1	2	1	<1	
Bromus tectorum																									
Oryzopsis hymenoides						3										2		5		<1					
										2															
Other Perennial Grasses		<1		6		<1	5	3	<1					6			<1	6	<1	1		<1	4	8	10
							5		<1		1						<1					2			
Other Annual Grasses																									
Perennial Forbs												<1													
																	1								
Annual Forbs																									
Half Shrubs																			3						
		8				4												3							
Totals	<1	<1	<1	7	<1	3	5	3	<1	<1	1	<1	<1	6	<1	4	<1	13	3	1	0	<1	5	8	10
	1	8	<1	1	<1	4	5	<1	<1	2	1	<1	0	0	0	0	1	3	0	0	<1	4	1	<1	0

TABLE II C-54

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4-Fenced
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii			<1		<1	1		1		<1			<1	<1		1		<1	<1	<1	<1	<1	<1		
	<1	<1	<1			<1		1	<1	<1	<1		<1	<1	<1	<1	1				1	<1	<1	<1	
Bromus tectorum																									
Oryzopsis hymenoides				2				6	2		5									<1		1	2		
		<1			3				2			<1			2	2		3		3					
Other Perennial Grasses							10	2							11			<1			<1				
	3	<1			1		<1	<1		<1				<1	<1	<1	<1				1				
Other Annual Grasses																									
Perennial Forbs																									2
													<1		<1								<1		
Annual Forbs																									
														<1							1				
Half Shrubs						5							3												
					2	2		3	2								7		2	4		3	6		
Totals	0	0	<1	2	<1	6	10	9	2	<1	5	0	3	<1	11	1	0	<1	<1	<1	<1	1	2	0	2
	3	<1	<1	0	6	2	<1	4	4	<1	<1	<1	<1	<1	2	2	8	3	2	7	3	3	6	<1	0

TABLE II C-55

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 5-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii														<1								<1			
			<1	<1			<1					1													
Bromus tectorum																									
Oryzopsis hymenoides			8	3	5		6	12	4	3	3			3				<1		2	<1		<1		
			1			<1		10	<1	3	9	3	6	2	3	7		6	10	3	5	4	1		4
Other Perennial Grasses		2	3			6			<1	1			<1							1		<1		4	
		<1			1		<1				<1	1					3			4	2				
Other Annual Grasses																									
Perennial Forbs																									
																							<1		
Annual Forbs													<1												
Half Shrubs																									
Totals	0	2	11	3	5	6	6	12	4	4	3	0	<1	3	0	0	0	<1	0	3	<1	<1	<1	4	0
	0	<1	1	<1	1	<1	<1	10	<1	3	9	5	6	2	3	7	3	6	10	7	7	4	1	<1	4

TABLE II C-56

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 5-Fenced
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	2	5						<1	7		3	1							3	2			<1	2	<1
		<1					<1	<1													2				2
Bromus tectorum																									
Oryzopsis hymenoides	5		1	3	3	3	2			3		6	1		2	1	5	11			4		1	<1	1
	4	<1	<1	3	1	3	1		2	8	7	1	4		1	2		<1	3	2				2	
Other Perennial Grasses	3		6			6		10	10	8	9		10	<1	<1	4		5	1	1	3	4	6	5	
		4	<1		<1	3	<1	2	<1	1				<1		3	1		3	1		5	3	5	2
Other Annual Grasses																									
Perennial Forbs		<1							5														1	2	3
	1						2												3	<1	1				
Annual Forbs																									
					<1																				
Half Shrubs								3	4																
																									2
Totals	10	5	7	3	3	9	2	13	26	11	12	7	11	<1	2	5	5	16	4	3	7	4	8	9	4
	5	4	<1	3	1	6	3	2	2	9	7	1	4	<1	1	5	1	<1	9	3	3	5	3	7	6

TABLE II C-57

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 6-Open
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii			<1					2		5	<1							6				<1			
			<1		<1							1			<1										
Bromus tectorum																									
Oryzopsis hymenoides																					1				
																				<1					
Other Perennial Grasses	15	12	3	5	4	5	30	25	1		6	6	2	1	10	11	10	4	30	8	6	3		10	5
		6	3	10	<1		5	8		7	8	7	9		3	10	5	3	6	5	6	4	2	2	2
Other Annual Grasses																									
Perennial Forbs				<1		1		15			4		<1		2	8	3	17				1		1	
		<1					<1				<1	2	7			<1	20		<1		2	2		13	
Annual Forbs																									
Half Shrubs																									
Totals	15	12	3	5	4	6	30	42	1	5	10	6	2	1	12	19	13	27	30	8	7	4	0	11	5
	0	6	3	10	<1	0	5	8	0	7	8	10	16	0	3	10	25	3	6	5	8	6	2	15	2

TABLE II C-58

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 6-Fenced
Clipping Period: Late June

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1		<1	<1		<1		<1				<1	<1			<1		1							
																									3
Bromus tectorum																									
Oryzopsis hymenoides		3			5	1				<1									<1			1			2
			3			1				<1	<1					3				1		3			1
Other Perennial Grasses	2	6	2	4	2	<1	1	6	2	3	3	6	5	2	5	3	2	2	5	1	2	3		2	<1
	2	<1	5	<1	2	2	3	3	1	<1	8	1	1		2		5		3	7	3	2	3	2	2
Other Annual Grasses																									
Perennial Forbs				<1										<1		5	<1		<1						
					<1	1	<1	1			<1											<1	<1	<1	
Annual Forbs																									
Half Shrubs																									
Totals	2	9	2	4	7	1	1	6	2	3	3	6	5	2	5	8	2	3	5	1	2	4	0	2	2
	2	<1	8	<1	2	4	3	4	1	<1	8	1	1	0	2	3	5	0	3	8	3	5	3	2	6

TABLE II C-59

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii																									
																							<1		
Bromus tectorum																									
Oryzopsis hymenoides						2		8			10	6	13			20				7	13	20			
	1										1				2	2							2		1
Other Perennial Grasses	11	11		<1	22	20	25	1	23	8		15	2	20	17	2	3	4	5	3			4	19	22
	<1	10	13	2	<1	12	10	15	25	5	5	3	11	1	5	11	13	12	7	6	6	8	11	11	8
Other Annual Grasses																									
Perennial Forbs					1	2							1	7	19				10	2					
	<1	21										<1		<1					5				3		
Annual Forbs								1																	
	<1																								
Half Shrubs	2	1			3																				
														36											
Totals	13	12	0	<1	26	24	25	10	23	8	10	21	16	27	36	22	3	4	15	12	13	20	4	19	22
	1	31	13	2	<1	12	10	15	25	5	6	3	11	1	43	13	13	12	12	6	6	8	16	11	9

TABLE II C-60

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 1-Fenced
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii		<1	1	2	10	7	3																		
							1																3		
Bromus tectorum																									
Oryzopsis hymenoides	<1	8						3		6	3	8	3	5	4					5				6	3
	4		19		2					5							1		2	5	12	1			
Other Perennial Grasses	17	16	6	5	4	4	10	20	5	5	2	5	12	5		11	5	35	12	4	16	40	7	15	20
	3	25		12	11	17	12		15	6	3	8	13	6	14	4	7	7	11	35	6	12	18	30	35
Other Annual Grasses																									
Perennial Forbs		28	26	11	<1		<1	<1	36	1		2		7	1	<1				5	<1				1
		1		<1			2				1						<1	7			<1	1			
Annual Forbs																<1									
Half Shrubs			2				1		<1		3													2	
													3												
Totals	17	52	35	18	14	11	14	23	41	12	8	15	15	17	5	11	5	35	12	14	16	40	7	23	24
	7	26	19	12	13	17	15	0	15	11	4	8	16	6	14	4	8	14	13	40	18	14	21	30	35

TABLE II C-61

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	<1						1					9	9					<1						6	
	5		7	7				6		7			7			<1			10						
Bromus tectorum											1														
Oryzopsis hymenoides										4															
					<1				4	3						2		4							
Other Perennial Grasses	11	10	5	15	6	20		12	4	7	4			12	22	1	6	13	16	1			2	11	
	4	5		17	25	6	1	4						22	1	1	4	25	11	10		7		30	11
Other Annual Grasses					1																				
																							<1		
Perennial Forbs	6				2	15				3	1			7										1	
									6	3	1	2	1	<1		9	1								1
Annual Forbs											30														
	1					1		1	<1	5		5	3		1	<1									
Half Shrubs										1															
Totals	17	10	5	15	8	35	1	12	4	15	36	9	9	19	22	1	6	13	16	<1	0	0	2	18	0
	10	5	7	24	25	7	1	11	10	18	1	7	4	29	2	12	5	29	21	10	0	7	<1	30	12

TABLE II C-62

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

CHAINED PINYON-JUNIPER RANGELAND

Plot Number: 2-Fenced
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii																	10			1	3		1	2	
												6								<1		<1			
Bromus tectorum					1											<1									
Oryzopsis hymenoides						17		6						1	13	4	4								
		20	4	3		10			2		1														
Other Perennial Grasses	16	11	33	4	25		25	2	40	2	13		13	9	8			4	8	7	10			10	
	2	4	7	9			3	2	16	10	7	4	1			5	8	8	10	1	6	12	3	6	1
Other Annual Grasses																									
Perennial Forbs	<1				9	1	5	6					10	1	1		20							<1	
					<1			1	10		1	6	2											22	
Annual Forbs		4			4									3		30						<1			
													1												
Half Shrubs												5													
Totals	16	15	33	4	39	18	30	14	40	2	13	5	23	14	22	34	34	4	8	8	13	<1	1	12	0
	2	24	11	12	<1	10	3	3	28	10	9	16	4	0	0	5	8	8	10	1	6	12	3	28	1

TABLE II C -63

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number: 3-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	4	1	6	1	1	7	4	4	3	5	7	2	4	3	4	3	5	4	2	2	3	2	2	3	1
	3	6	2	3	4	5	10	6	9	6	1	7	6	4	10	4	1	6	2	6	4	3	10	9	9
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	7	5	6	7	6	5	4	3	7	10	6	7	3	10	6	10	10	3	5	6	3	4	4	4	10
	9	4	7	6	7	5	5	3	12	7	8	4	6	7	6	7	4	7	6	5	4	5	7	5	6
Other Annual Grasses																									
Perennial Forbs	<1	<1	1	<1	<1	3		1		1	2		2	1	5	1	1	<1	3	1	<1	<1	<1	2	<1
		<1	1		<1	2	1	2	2	1	2	1	3	2		<1	1	2	2	1	1	<1	4	1	2
Annual Forbs																									
Half Shrubs																									
			1				<1						2					4							
Totals	11	6	13	7	6	15	8	8	10	16	15	9	9	14	15	14	16	7	10	9	6	6	6	9	11
	12	10	11	9	11	12	16	11	23	14	11	12	17	13	16	11	6	15	10	13	9	8	21	15	17

TABLE II C-64

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

UPLAND SAGEBRUSH

Plot Number : 3-Fenced
Clipping Period : Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	3	3	6	5	4	4	2	5	6	3	4	3	7	4	5	3	3	3	2	10	2	3	4	8	4
	3	6	3	3	8	5	8	2	6	3	9	5	5	1	4	2	4	3	5	4	2	1	5	3	3
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	6	3	4	10	9	3	5	7	4	6	5	7	5	9	2	9	6	7	6	4	10	2	3	3	4
	5	6	4	15	4	3	2	3	6	5	7	8	6	12	8	5	5	4	8	5	8	4	5	8	3
Other Annual Grasses																									
Perennial Forbs				<1	<1					1		<1	<1	<1	<1	1	<1		1	<1	<1	1	4	4	1
	2	1	1	<1	1	1	<1	2	2	2	1	5	1	<1	<1	<1	4	1		1	7	2	2	1	3
Annual Forbs																									
Half Shrubs																							1	<1	
												1							2						
Totals	9	6	10	15	14	7	7	11	10	10	9	10	12	13	7	13	9	10	9	14	12	6	12	15	9
	10	13	8	18	13	10	10	7	14	10	17	19	12	13	12	7	13	8	15	10	17	7	13	12	9

TABLE II C-65

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii	2	5			1		<1	5		<1	1	2	7	3	3			1			18	5			4
		3			7	1					2	2		2				3				2	1		4
Bromus tectorum			1																						
Oryzopsis hymenoides				12		2																			1
																	10			4					1
Other Perennial Grasses		7	11			8				<1			2			22	5		3		1	<1	2		9
	2			4	53				9	7					<1					7				1	
Other Annual Grasses																									
Perennial Forbs																						<1			
																								1	
Annual Forbs																									
																							<1	<1	<1
Half Shrubs					30						30					<1									3
Totals	2	12	12	12	31	10	<1	5	0	<1	31	2	9	3	3	22	5	1	3	0	18	5	2	0	17
	2	3	0	4	60	1	0	0	9	7	2	2	0	2	<1	0	10	3	0	11	0	2	1	2	5

TABLE II C-66

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

BOTTEMLAND SAGEBRUSH

Plot Number: 4- Fenced
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii		4	3					2			<1			1	3	1		1	<1	2				5	
					2		<1	2	2			1		6		3	2		6		5	1			
Bromus tectorum																									
Oryzopsis hymenoides				6	2		3			5			5					2		2	4				
				6						2			3			6							5	7	
Other Perennial Grasses					1						1	11	5				<1	22		1		5	10		15
		1			2			5		1			2		8				4	1				1	
Other Annual Grasses																									
Perennial Forbs																					1				
														<1						<1					
Annual Forbs														1			1							1	
Half Shrubs			10		7			20				13												40	
	4									8						3							4		
Totals	0	4	13	6	10	0	3	22	0	5	1	24	10	2	3	1	1	25	<1	5	5	5	10	46	15
	4	1	0	6	4	0	<1	7	2	11	0	1	5	6	8	12	2	0	10	1	5	1	9	8	0

TABLE II C -67

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 5-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii				10								5					1		25	10	3	1	1		
	1		1				1																		
Bromus tectorum																									
Oryzopsis hymenoides	2	6	3	5			2	11		<1	3		<1		<1	4		1	3		1				
			1	1	1			2	6		1	1	3	7	<1			2	4	10	1		4	<1	15
Other Perennial Grasses		3		30	3	25		2			2	37	<1	<1	3		2	1		10	1		1		1
	1	9		11	5			8		10		1			<1		1	4				3	5	1	
Other Annual Grasses								1																	
											6														
Perennial Forbs				2								3			<1		1								
								1			1					<1								1	
Annual Forbs																									
Half Shrubs																									
Totals	2	9	3	47	3	25	2	14	0	<1	5	45	<1	<1	3	4	2	1	28	20	4	1	1	0	1
	1	9	1	12	5	0	1	10	6	10	6	1	3	7	<1	<1	1	6	4	10	1	3	9	2	15

TABLE II C-68

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 5-Fenced
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii				2	1	1									1	1	<1	<1	2	1		2			
			2							<1					<1	1			1	1					
Bromus tectorum																									
Oryzopsis hymenoides	10	1	6	8		17		15	2	<1	<1	1	1		<1	2	<1	3	2	<1	8	<1			
		7		2	1	1					4					3	3		<1						2
Other Perennial Grasses	3	2	4	2					12	6	<1	6		12	1					7	11	4	5	11	5
		1	6	4	4	3	1		8	4		5	4	5	2	16	3		3	12	3	10		2	10
Other Annual Grasses																	<1								
																									1
Perennial Forbs						2									1						10			4	
						<1								<1		2			3			1			
Annual Forbs					<1																				
Half Shrubs								<1						3	3				5		1	3			
														1					3	1					
Totals	13	3	10	12	1	20	0	15	14	6	<1	7	1	15	6	3	<1	3	9	8	30	9	5	15	5
	0	8	8	6	5	4	1	0	8	4	4	5	4	6	2	22	6	0	10	14	3	11	0	2	13

TABLE II C-69

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 6-Open
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii									10		40												5		
												2				2									
Bromus tectorum																									
Oryzopsis hymenoides																									
Other Perennial Grasses	6	11	25	7	11	20	6	22	110	5		4	10	30	6	1	10	20	20	<1	<1	7	4		1
	3	1	1	7	3	4	10	7	4	1	2	10		3	5	9	5	10	3	2	13	10	11	10	10
Other Annual Grasses																									
Perennial Forbs		3	13			5	6	1	6	<1			20	2	<1	<1	4	5	1			12			
	<1						2	<1		<1		4			<1	2	2	1	<1	2	12	14	7	1	1
Annual Forbs																									
Half Shrubs																									
Totals	6	14	38	7	11	25	12	23	126	5	40	4	30	32	6	1	14	25	21	<1	<1	19	9	0	1
	3	1	1	7	3	4	12	7	4	1	2	16	0	3	5	13	7	11	3	4	25	24	18	11	11

TABLE II C-70

FRESH WEIGHT ESTIMATES (GRAMS) FOR THE SIX INTENSIVE STUDY PLOTS 1977

PINYON-JUNIPER WOODLAND

Plot Number: 6-Fenced
Clipping Period: Late July

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Agropyron smithii				1																					
											5														
Bromus tectorum																									
Oryzopsis hymenoides			3	3		2						2	17	2	4	3				<1		<1			
		3		12			2			1	<1	1		<1	7	4					1		3	3	1
Other Perennial Grasses		6		4	6	3	9	6	3	4	4	7	10	13	5	3	16	11	19	7	6	9		7	4
	15	6	5	4	6	5	9	12	16	3	1	7	5	11	2	2	15	<1	1	9	6	1	6	<1	6
Other Annual Grasses																									
Perennial Forbs								1	4			1	1	<1	6		7	3	<1	1		2		<1	
			14			<1	3		10	4	<1					<1	3		<1		5				9
Annual Forbs																									
Half Shrubs										1															
																	1								
Totals	0	6	3	8	6	5	9	7	7	5	4	10	28	15	15	6	23	14	19	8	6	11	0	7	4
	15	9	19	16	6	5	14	12	26	7	6	8	5	11	9	6	19	<1	1	9	12	1	9	3	16

TABLE II C-71

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 1-0

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	4				3.380		0.032			3.412
	8	0.874		1.936	5.458		1.893			10.161
	13	0.217			9.768					9.985
	15			2.199	9.699		0.244			12.142
	17				11.761		1.088			12.849
	32		0.039	2.059	5.146					7.244
	36		0.030	3.743	0.585		0.163			4.521
	38	1.419		0.199	8.157		0.060			9.835
	42									0
	47				1.848		0.065			1.913
LATE JUNE	7	0.056			10.000		0.112			10.168
	8			0.058	0.466					0.524
	21				18.744		0.911			19.655
	24				12.852		0.007			12.859
	28			0.179	4.397		3.729			8.305
	32				6.423		0.141			6.564
	33				0.452					0.452
	34				13.585		0.500			14.085
	38			0.999	3.800		0.059			4.858
	42		0.005		10.692		1.524		2.646	14.867
LATE JULY	12			6.868	9.776		0.031			16.675
	13			11.036	1.275		0.755			13.066
	19				2.198		3.601			5.799
	28		0.019		12.097					12.116
	36			0.792	4.855					5.647
	37				2.145		0.059			2.204
	39				1.784		0.445			2.229
	44				7.273		1.589			8.862
	46				2.774					2.774
	48			1.722	9.566		0.361			11.649

TABLE II C-72

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 1-Fenced

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	9	0.039		1.146	7.774		0.311			9.270
	12			3.528	13.524		0.110			17.162
	14						0.574			0.574
	15			0.585	7.619		0.418			8.622
	19				0.156					0.156
	25				21.157		0.014			21.261
	27			5.911	7.756					13.667
	28				6.480					6.480
	32			1.744	12.827		0.352			14.923
	46				2.099					2.099
LATE JUNE	5	6.957	0.024	0.900	4.421		0.359		1.495	14.156
	9	4.359		0.214	2.246		0.510			7.329
	10	3.003			6.738		5.004		0.706	15.451
	15		0.057	6.814	4.986		0.105			11.962
	21				33.247					33.247
	23			3.024	3.144		16.640		4.240	27.048
	26	1.424	1.426	2.946	12.123		3.738	0.027		21.684
	34	8.363	0.041	0.623	9.655		0.488			19.170
	38	1.440			10.008					11.448
	42			1.640	5.957		0.324			7.921
LATE JULY	3				6.418		19.146		1.128	26.692
	13			1.430	7.279		0.098			8.807
	15			3.230			0.310			3.540
	17				3.359					3.359
	25	0.131		3.420	23.092		2.730			29.373
	30			1.291	6.325		0.225			7.841
	35			4.100	2.776					6.876
	37	0.056			4.932					4.988
	40	1.142			12.560					13.702
	46			9.056	4.589		0.162			13.807

TABLE II C-73

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 2-0

	Quadrat Number	Agropyron smithii	Bromus tectorum	Oryzopsis hymenoides	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	10		3.857		3.991		0.319	1.434		9.601
	14	0.136			8.187		0.053			8.376
	16		0.058	0.080	17.579		0.144	0.003		17.864
	19				12.509		1.092			13.601
	20		0.065				0.053	0.009		0.127
	23		0.206	0.909			0.020	0.092		1.227
	31	1.695	0.235	2.915			0.850	0.079		5.774
	42		0.155		8.030		0.006	0.358		8.549
	44	2.379			7.069			0.011		9.459
	46		3.731		15.183		0.806	0.753		20.473
LATE JUNE	6				12.531		0.069			12.600
	11		0.198		4.839					5.037
	17				1.961		0.230			2.191
	24				0.305			0.065		0.370
	37						0.149			0.149
	41						11.110	0.099		11.209
	42	4.505			0.919		0.065	0.021		5.510
	45				5.532					5.532
	48		0.120		1.236		9.546	2.570		13.472
	49	8.689			0.922		1.953	0.072		11.636
LATE JULY	3				5.683			0.070		5.753
	5				4.247	0.124		0.745		5.116
	10			4.072	8.245		1.167			13.484
	17				2.533					2.533
	24	3.042			6.862		0.210			10.114
	30			0.446	16.991					17.437
	35	3.942		1.177			0.875	1.681		7.675
	41	0.072		0.520			3.360	0.030		3.982
	48					0.012				0.012
	50				5.300		0.091			5.391

TABLE II C-74

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 2-Fenced

	Quadrat Number	Agropyron smithii	Bromus tectorum	Oryzopsis hymenoides	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	3		0.528		3.454		1.431	0.088	0.013	5.514
	4	0.399	1.762		2.435		0.060	1.346		6.002
	9		0.040	5.803	0.045		0.837	0.026		6.751
	15				0.071					0.071
	24		0.952		0.840		0.217			2.009
	28		0.056		3.931		4.899	0.028		8.914
	33		0.080		4.099		0.989	0.100		5.268
	35	0.847	0.053	1.730	0.833		0.088			3.551
	42	3.632	0.327		0.709		0.481	0.047	3.411	8.607
	47			0.263	2.290		5.260			7.813
LATE JUNE	1	1.934			2.655					4.589
	7	5.599		0.689	4.332		0.811	0.121		11.552
	22	3.876			0.760		6.114	0.008		10.758
	23	0.139	0.017		0.488		12.139	0.039		12.822
	26				4.542		4.388			8.930
	27				1.761		2.734	0.586		4.495
	31				1.742					1.742
	35	0.416			1.436					1.852
	42				0.820		0.251			1.071
	45				1.263					1.263
LATE JULY	3				30.989		0.415			31.404
	8			6.770	1.236		4.365			12.371
	9				21.065		0.098			21.163
	14			0.577	8.188			0.528		9.293
	15			13.282	4.878		0.250			18.410
	19				3.768	0.050	0.419			4.237
	22							0.038		0.038
	36			0.523	2.732		0.196			3.451
	47	0.377			4.890			0.003		5.270
	49	0.200			1.299	0.019	12.018	0.012		13.548

TABLE II C-75

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977
PLOT NUMBER 3-0

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	1	1.632			10.167		3.257	0.123		15.179
	4	0.685			10.643		3.511	0.177		15.016
	14	1.628		0.391	10.535		1.222	0.095		13.871
	22	0.118			9.820		1.828	0.009		11.775
	23	1.850			6.248		5.527	0.021		13.646
	28	0.860			9.478		2.387	0.012		12.737
	29	5.619			9.614		3.894			19.127
	34	2.024			11.147		2.274	0.077		15.522
	44	0.857			12.185		3.035	0.090		16.167
	50	0.677			12.946		2.022	0.104		15.749
LATE JUNE	2	1.300			7.059		0.965			9.324
	4	8.095			4.824		1.450			14.369
	7	4.652			7.483		0.364			12.499
	22	3.294			4.626		1.543			9.463
	24	6.499			1.970		1.547			10.016
	28	4.737			1.974		0.836			7.547
	38	5.307			2.199		1.298			8.804
	43	4.449			1.649		1.479			7.577
	46	5.733			0.751		3.241		0.238	9.963
	49	5.670			2.311		0.347			8.328
LATE JULY	2	0.983			6.918		0.630			8.531
	4	1.353			7.262		0.528			9.143
	12	1.914			6.432		0.191			8.537
	19	2.760			6.499		2.817			12.076
	21	3.430			3.508		0.643			7.581
	24	0.794			4.992		1.199			6.985
	36	1.382		0.396	5.297		1.081			8.156
	37	2.483			3.729		1.264			7.476
	41	2.536			5.989		1.650			10.175
	45	3.019			4.399		1.170		0.305	8.893

TABLE II C-76

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977
PLOT NUMBER 3-Fenced

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	5	7.280			6.945		2.554	0.052		16.831
	6	5.236			13.920		1.687	0.142		20.985
	7	3.010			4.482		4.856	1.986		14.334
	13	3.365			14.496		2.128	0.256		20.245
	14	1.545			11.260		4.183	0.060		17.048
	20	4.714			12.430		7.298	0.132		24.574
	28	5.600			13.600		2.033	0.066		21.299
	31	5.523			8.374		2.048	0.163		16.108
	32	1.802			12.291		3.299	0.035		17.427
	34	2.165			9.894		3.330	0.024		15.413
LATE JUNE	5	6.139			2.893		0.273			9.305
	10	3.390			7.171		0.075			10.636
	12	4.559			4.199		1.751			10.509
	16	3.248			5.725		0.788			9.761
	18	7.362			6.974		0.291			14.627
	19	9.483			4.454		1.099			15.036
	25	2.636			5.899		2.515			11.050
	33	8.199			7.433		3.287			18.919
	37	5.834			7.818		3.675		0.163	17.490
	45	3.929			3.465		2.549		1.171	11.115
LATE JULY	12	4.358			7.715		0.208			12.283
	15	4.399			2.232		0.253			6.884
	16	2.581			7.611		2.199			12.391
	18	1.944			11.299		0.100			13.343
	21	3.399			10.352		0.161			13.912
	32	11.480			1.357		0.255			13.092
	34	7.625			7.739		1.199			16.563
	35	3.874			6.472		2.294			12.640
	37	4.467			6.809		3.495		0.253	15.024
	46	2.900			12.007		4.015			18.922

TABLE II C-77

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 4-0

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	2	8.194			3.734			0.213		12.141
	6	0.322			14.582					14.904
	12	0.551	0.005		0.935					1.491
	13	4.148	0.025		1.071					5.244
	30						1.749	0.021		1.770
	42				0.010			0.189		0.199
	44	4.404	0.020		0.327			0.039		4.790
	46	4.635	0.059					0.208		4.902
	48	0.123						0.007		0.130
	50			8.293				0.012		8.305
LATE JUNE	2	0.194			0.286					0.480
	6	1.923		2.427	0.574					4.924
	10	1.027								1.027
	12	1.821			0.099		0.091			2.011
	15	0.606								0.606
	16	1.667			1.173					2.840
	18	1.551		2.175	4.127					7.853
	27									0
	35	0.235		0.769						1.004
	46	0.365								0.365
LATE JULY	1	0.577			0.029					0.606
	12	1.005								1.005
	19				0.415					0.415
	21	6.774			0.102					6.876
	25	1.277		0.243	3.361				0.757	5.638
	27	2.035								2.035
	30	0.127			28.289					28.416
	33	0.044								0.044
	36	0.935								0.935
	50	1.629		0.270						1.899

TABLE II C-78

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977
PLOT NUMBER 4-Fenced

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	1	0.193	0.033		0.062			0.011		0.299
	2	0.227	0.108	0.821						1.156
	4	2.861	0.041		0.057		0.100	0.012		3.071
	8							0.533		0.533
	15	0.544	0.005	0.631	0.058					1.238
	22	0.810			0.336			0.015		1.161
	29	0.091		3.858	0.006			0.003		3.958
	33	2.690						0.022		2.712
	38	1.681	0.032		0.155			0.195		2.063
	44									
LATE JUNE	3	0.360								0.360
	12									0
	19	0.372			0.129					0.501
	23	0.399		1.200						1.599
	28	0.390						0.015		2.004
	36	0.847			0.077					0.924
	39	0.880			2.060			0.179		3.119
	44								0.912	0.912
	46	0.927			0.567			0.586		2.080
	48	0.655			0.027			0.064	2.075	2.821
LATE JULY	10			1.599						1.599
	17				0.025		0.046	0.112		0.183
	18	0.618		0.872	9.899					11.389
	22	0.059			1.629					1.688
	24	1.867						0.030	9.772	11.669
	33	0.397			0.648					1.045
	38			0.800	0.583					1.383
	39	4.068					0.268			4.336
	41	1.415		2.280					0.363	4.058
	42	0.600								0.600

TABLE II C-79

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977
PLOT NUMBER 5-0

	Quadrat Number	*Agropyron smithii*	*Bromus tectorum*	*Oryzopsis hymenoides*	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	2			11.234	2.037					13.271
	12			3.772						3.772
	15			0.360	2.341		0.015			2.716
	19			5.170	1.151					6.321
	25				0.146					0.146
	32			0.135	0.954					1.089
	35	0.098			0.191					0.289
	39			7.930						7.930
	43			8.109	0.228					8.337
LATE JUNE	2				1.671					1.671
	4			2.758	0.586					3.344
	5			4.408			0.127			4.535
	11			3.264	0.099					3.363
	21			0.624						0.624
	23			0.268			0.118			0.386
	24			0.086	1.264					1.350
	34			0.394	0.038					0.432
	38	0.211		6.164						6.375
	43	0.078		8.437	0.160					8.675
LATE JULY	2			6.047	0.649					6.696
	11			1.105	0.167					1.272
	12	3.955			16.672		0.339			20.966
	21	2.273		0.439	1.583					4.295
	31									0
	36			0.107	2.420		0.086			2.613
	39			4.300	0.589					4.889
	44			0.714						0.714
	46			0.723						0.723
	48			1.791	2.290					4.081

TABLE II C-80

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977
PLOT NUMBER 5-Fenced

	Quadrat Number	Agropyron smithii	Bromus tectorum	Oryzopsis hymenoides	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	1	4.362		1.266						5.628
	2	2.172		5.342	8.679		5.378			21.571
	18	0.146			5.114		0.305			5.565
	19	3.522			3.594			0.100		7.216
	26	0.223		0.414	7.258		0.100			7.995
	28			0.241	4.600		0.330			5.171
	29		0.017	1.145	2.511					3.673
	35			0.211	0.157		0.115			0.483
	40	4.607		0.450	5.811		1.160			12.028
	43	0.157			0.252					0.409
LATE JUNE	1	3.487		4.042	4.201		0.499			12.229
	2	7.980			0.099		0.054			8.133
	5			1.181						1.181
	13			2.126	6.057		0.075			8.258
	21			1.508	1.242					2.750
	26			3.097	0.215		0.521			3.833
	29			3.791						3.791
	32	0.238		1.277	0.361		3.023			4.899
	36			6.938						6.938
	39			0.087	0.323		0.040			0.450
LATE JULY	2			0.550	1.448					1.998
	4	0.769		5.088	3.246					9.103
	19	1.693		1.399	0.300				3.082	6.474
	20	1.013		0.136						1.149
	23			3.847	3.895					7.742
	27			4.557	0.621					5.178
	30			0.722	1.382					2.104
	31			0.583	0.876					1.459
	42			1.099	0.447					1.546
	48									0

TABLE II C-81

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 6-0

	Quadrat Number	Agropyron smithii	Bromus tectorum	Oryzopsis hymenoides	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	1	0.266			5.032		1.581			6.879
	2				4.178		0.732			4.910
	7	0.263			3.122		0.020			3.405
	17		0.003		21.150		22.966			44.119
	31				2.724		0.274			2.998
	33	0.162			7.286		0.062	0.010		7.520
	34									0
	39	1.331			4.016		4.410			9.757
	40	0.193			4.368		0.500			5.061
	41				5.552		5.511			11.063
LATE JUNE	8	1.952			3.751		15.490			21.193
	10	5.922			0.499		0.009			6.430
	13	0.133			0.690		1.071			1.894
	17	0.314			5.865		1.467			7.646
	26									0
	27	0.027			2.053		0.394			2.474
	36	0.014			5.385		3.077			8.476
	38	0.331			5.977		5.710	0.008		12.026
	41	0.132			4.151		0.318			4.601
	47	0.375			1.116		1.241			2.732
LATE JULY	3				13.939		5.472			19.411
	8	0.629			12.229		0.346			13.204
	9	5.740			69.800		3.619	0.776		79.935
	14				14.915		0.630			15.545
	15				3.311		0.060			3.371
	19	0.140			10.230		0.478			10.848
	22	0.178			3.529		8.751			12.458
	36				1.051					1.051
	47				5.616		11.044			16.660
	49				3.985		0.523			4.508

TABLE II C-82

OVEN DRY WEIGHTS (GRAMS) FOR THE SIX INTENSIVE STUDY SITES, 1977

PLOT NUMBER 6-Fenced

	Quadrat Number	Agropyron smithii	Bromus tectorum	Oryzopsis hymenoides	Other Perennial Grasses	Other Annual Grasses	Perennial Forbs	Annual Forbs	Half Shrubs	Total Weight
LATE MAY	5			1.999	1.135		0.680	0.069		3.883
	14				3.048					3.048
	15			0.926	3.019		1.976			5.921
	18				0.366					0.366
	20				6.739		5.853			12.592
	22			0.093	1.802		0.299			2.194
	24			0.649	0.749		0.117			1.515
	34				3.193		0.350			3.543
	40				4.322		0.308			4.630
	43				3.900					3.900
LATE JUNE	6	0.213		0.440	0.098					0.751
	13	0.332			3.446		0.070			3.848
	14				0.570		0.078			0.648
	19			0.162	4.006		0.225			4.393
	36			0.218	3.646		0.236			4.100
	38				0.470					0.470
	41			1.293						1.293
	46				2.200					2.200
	48				2.808		1.548			4.356
	49	0.023			2.744		0.847			3.614
LATE JULY	1									0
	12			1.056	2.434		0.254			3.744
	19				6.484		0.180			6.664
	21				2.864					2.864
	25				0.990					0.990
	27			1.254	2.667		0.194	0.008		4.123
	30	0.164			2.732		0.070			2.966
	33			0.118	7.669					7.787
	36	3.535		0.345	0.377		0.213			4.470
	50			0.854	1.157		4.174			6.185

SOIL SURVEY &
PRODUCTIVITY
ASSESSMENT

II C-4 Soil Survey and Productivity Assessment

Data collection, analysis, and interpretation of these programs has been completed. Detailed information concerning these studies appears in previously released Quarterly Data Reports.

OTHER STUDIES

III

OTHER STUDIES

Only two of the programs in the Other Studies categories were included in the Interim Monitoring Program. These are the Revegetation and Microenvironmental Studies. The other programs were completed during the Baseline period, including the Fish and Wildlife Management Plan, Scenic Studies, Aerial Photographic Studies, and Archaeological Studies.

REVEGETATION STUDIES

III B Revegetation Program

Introduction

Evaluation of disturbed areas revegetated during the baseline period was begun in 1976. These studies are designed to measure the progress of the revegetated areas over time and to help evaluate trends occurring in the reestablishment of desirable vegetation cover as defined by the Environmental Lease Stipulations.

Scope of Study

At the onset of these studies all disturbed areas (mostly drill pads and their access roads) were documented using photographic techniques; seed bed treatments, seed mixtures, and methods were also recorded. In 1976 each pad was evaluated using a combined occular and dipping method combined with phytosociological sampling techniques. During the Interim Period Monitoring sampling has been refined to include eight drill pad sites that are representative of major vegetation types within the study area. The categories sampled include, disturbed areas within upland sagebrush, bottomland sagebrush, chained pinyon-juniper rangeland, pinyon-juniper woodland, and agricultural meadowland.

Methods

Two major parameters were sampled on each disturbed site: 1) species frequency and cover, and 2) herbaceous standing crop.

Species frequency and cover was sampled using 10 one-centare quadrats permanently located in each disturbed site. Frequencies were noted by presence; percent cover of each species, litter, soil, rock, mosses, and lichens were estimated.

Herbaceous standing crop was measured at peak season (in August). Five, one-centare quadrats were randomly located in each disturbed site using a random number generator and clipped. Four fractions were clipped to ground level and weighed. The four fractions separated were, annual grasses, annual forbs, perennial grasses, and perennial forbs. In addition to the five clip quadrats, 50 one-centare quadrats, including the clip quadrats, were estimated occularly.

Results and Discussion

The results of the combined phytosociological and standing crop measurements are presented below. These data have not been subjected to analysis at this time.

Table III B-1
REVEGETATION PLOT DATA
JUNE 1977

STAND # SG-1

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER(%)	# OF PLOTS OF OCCURRENCE	FREQUENCY(%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron smithii	$1m^2$	224.0	224.0	10	100	97.2	55.6
Kochia sp.	"	0.5	0.5	1	10	0.2	5.6
Salsola sp.	"	6.0	6.0	7	70	2.6	38.9

Table III B-2

REVEGETATI PLOT DATA
JUNE 1977

STAND # SG-10

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron cristatum	$1m^2$	4.0	4.0	3	30	4.0	5.9
Agropyron desertorum	"	3.0	3.0	2	20	3.0	3.9
Agropyron smithii	"	46.0	6.0	10	100	45.5	19.6
Bromus tectorum	"	2.0	2.0	1	10	2.0	2.0
Bouteloua gracilis	"	0.5	0.5	1	10	0.5	2.0
Chenopodium album	"	1.5	1.5	2	30	1.5	5.9
Crepis acuminatus	"	1.0	1.0	1	10	1.0	2.0
Kochia sp.	"	14.5	4.5	9	90	14.4	17.6
Melilotus sp.	"	1.5	1.5	2	20	1.5	3.9
Oryzopsis hymenoida	"	1.5	1.5	2	20	1.5	3.9
Penstemon sp.	"	0.5	0.5	1	10	0.5	2.0
Poa sp.	"	0.5	0.5	1	10	0.5	2.0
Salsola sp.	"	20.0	20.0	10	100	19.8	19.6
Sphaeralcea coccinea	"	2.0	2.0	1	10	2.0	2.0
Stipa comata	"	0.5	0.5	1	10	0.5	2.0
Tragopogun dubius	"	0.5	0.5	1	10	0.5	2.0
Unknown Perennial Forb	"	1.5	1.5	2	20	1.5	3.9

Table III B-3
REVEGETATION PLOT DATA
JUNE 1977

STAND # SG-15

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER(%)	# OF PLOTS OF OCCURRENCE	FREQUENCY(%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron smithii	$1m^2$	63.5	63.5	9	90	80.4	36
Agropyron trachycaulum	"	1.0	1.0	1	10	1.3	4
Bromus tectorum	"	1.0	1.0	1	10	1.3	4
Chenopodium album	"	0.5	0.5	1	10	0.6	4
Crepis acuminatus	"	0.5	0.5	1	10	0.6	4
Descurainia pinnata	"	1.0	1.0	2	20	1.3	8
Koeleria gracilis	"	1.0	1.0	2	20	1.3	8
Oryzopsis hymenoida	"	2.5	2.5	3	30	3.2	12
Unknown Perennial Grass	"	8.0	8.0	5	50	10.1	20

Table III B-3
REVEGETATI PLOT DATA
JUNE 1977

STAND # SG-16

of 2 pages

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	X̄ COVER(%)	# OF PLOTS OF OCCURRENCE	FREQUENCY(%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	$1m^2$	2.5	2.5	2	20	1.3	3.7
Agropyron intermedium	"	16.0	16.0	3	30	8.6	5.6
Agropyron smithii	"	45.5	45.5	10	100	24.4	18.5
Agropyron trachycaulum	"	2.5	2.5	2	20	1.3	3.7
Astragalus kentrophyta	"	0.5	0.5	1	10	0.3	1.9
Bromus tectorum	"	7.0	7.0	5	50	3.8	9.3
Carex sp.	"	0.5	0.5	1	10	0.3	1.9
Chrysothamnus viscidiflorus	"	1.0	1.0	1	10	0.5	1.9
Comandra umbellata	"	0.5	0.5	1	10	0.3	1.9
Crepis acuminatus	"	1.0	1.0	2	20	0.5	3.7
Festuca brachyphylla	"	0.5	0.5	1	10	0.3	1.9
Kochia sp.	"	2.0	2.0	3	30	1.1	5.6
Koeleria gracilis	"	4.5	4.5	3	30	2.4	5.6
Lupinus argenteus	"	2.0	2.0	1	10	1.1	1.9
Oryzopsis hymenoida	"	0.5	0.5	1	10	0.3	1.9
Perennial Grass	"	0.5	0.5	1	10	0.3	1.9
Phlox longifolia	"	1.0	1.0	2	20	0.5	3.7
Poa sp.	"	1.0	1.0	2	20	0.5	3.7
Salsola kali	"	96.0	96.0	10	100	51.5	18.5

Table III B-3 (Continued)

2 of 2 pages

STAND # SG-16

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Sphaeralcea coccinea	1m^2	1.0	1.0	1	10	0.5	1.9
Trifolium gymnocarpon	"	0.5	0.5	1	10	0.3	1.9

Table III B-4
REVEGETATI PLOT DATA
JUNE 1977

STAND # SG-17

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	$1m^2$	21.5	21.5	3	30	12.1	7.1
Agropyron intermedium	"	16.5	16.5	5	50	9.3	11.9
Agropyron smithii	"	96.5	96.5	9	90	54.2	21.4
Agropyron trachycaulum	"	2.0	2.0	1	10	1.1	2.4
Agropyron trichophorum	"	19.0	19.0	6	60	10.7	14.3
Antennaria rosea	"	1.0	1.0	1	10	0.6	2.4
Cryptantha sp.	"	0.5	0.5	1	10	0.3	2.4
Descurainia pinnata	"	0.5	0.5	1	10	0.3	2.4
Kochia sp.	"	5.0	5.0	1	10	2.8	2.4
Koeleria gracilis	"	2.0	2.0	3	30	1.1	7.1
Lappula redowskii	"	0.5	0.5	1	10	0.3	2.4
Lepidium sp.	"	4.0	4.0	3	30	2.2	7.1
Oryzopsis hymenoida	"	1.5	1.5	2	20	0.8	4.8
Perennial Grass	"	4.0	4.0	2	20	2.2	4.8
Salsola sp.	"	2.0	2.0	1	10	1.1	2.4
Stipa comata	"	1.0	1.0	1	10	0.6	2.4
Symphoricarpos sp.	"	0.5	0.5	1	10	0.3	2.4

Table III B-5
REVEGETATION PLOT DATA
JUNE 1977

STAND # SG-18

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	$1m^2$	1.5	1.5	2	20	1.0	5.0
Agropyron smithii	"	32.5	32.5	10	100	21.5	25.0
Agropyron trachycaulum	"	3.5	3.5	3	30	2.3	7.5
Artemisia tridentata	"	0.5	0.5	1	10	0.3	2.5
Cercocarpus montanus	"	0.5	0.5	1	10	0.3	2.5
Chenopodium album	"	0.5	0.5	1	10	0.3	2.5
Crepis acuminatus	"	2.0	2.0	2	20	1.3	5.0
Kochia sp.	"	102.0	102.0	9	90	67.6	22.5
Lupinus argenteus	"	0.5	0.5	1	10	0.3	2.5
Oryzopsis hymenoida	"	1.0	1.0	2	20	0.7	5.0
Purshia tridentata	"	0.5	0.5	1	10	0.3	2.5
Sitanion longifolium	"	0.5	0.5	1	10	0.3	2.5
Trifolium gymnocarpon	"	1.5	1.5	3	30	1.0	7.5
Unknown Perennial Forb	"	0.5	0.5	1	10	0.3	2.5
Unknown Perennial Grass	"	3.5	3.5	2	20	2.3	5.0

Table III B-6
REVEGETATI PLOT DATA
JUNE 1977

STAND # SG-19

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron intermedium	$1m^2$	1.0	1.0	2	29	0.5	6.1
Agropyron smithii	"	14.0	14.0	7	100	7.1	21.1
Agropyron trachycaulum	"	4.0	4.0	3	43	2.0	9.1
Agropyron trichophorum	"	3.5	3.5	2	29	1.8	6.1
Kochia sp.	"	104.0	104.0	7	100	52.9	21.1
Oryzopsis hymenoida	"	1.5	1.5	2	29	0.8	6.1
Poa sp.	"	2.0	2.0	1	14	1.0	3.0
Salsola sp.	"	29.0	29.0	7	100	14.8	21.1
Stipa comata	"	1.5	1.5	2	29	0.8	6.1

Table III B-7
REVEGETATION PLOT DATA
JUNE 1977

STAND # SG-21

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron intermedium	1m^2	7.0	7.0	4	40	5.2	16.7
Agropyron smithii	"	6.0	6.0	5	50	4.5	20.8
Artemisia ludoviciana	"	5.0	5.0	1	10	3.7	4.2
Descurainia sp.	"	0.5	0.5	1	10	0.4	4.2
Erigeron sp.	"	0.5	0.5	1	10	0.4	4.2
Kochia sp.	"	4.0	4.0	1	10	3.0	4.2
Melilotus officinalis	"	16.0	16.0	3	30	11.9	12.5
Salsola sp.	"	95.0	95.0	8	80	70.9	33.3

Table III B-8
REVEGETATI PLOT DATA
JUNE 1977

STAND # NQ-12

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER (%)	# OF PLOTS OF OCCURRENCE	FREQUENCY (%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	$1m^2$	6.0	6.0	1	10	7.6	2.6
Agropyron smithii	"	8.0	8.0	7	70	10.2	18.0
Agropyron trachycaulum	"	25.0	25.0	7	70	31.8	18.0
Bromus tectorum	"	2.0	2.0	4	40	2.6	10.3
Carex sp.	"	1.5	1.5	2	20	1.9	5.1
Chenopodium album	"	0.5	0.5	1	10	0.6	2.6
Haplopappus nuttallii	"	0.5	0.5	1	10	0.6	2.6
Lepidium densiflorum	"	2.5	2.5	4	40	3.2	10.3
Oryzopsis hymenoida	"	14.0	14.0	7	70	17.8	18.0
Phlox hoodii	"	1.0	1.0	1	10	1.3	2.6
Physaria sp.	"	1.5	1.5	2	20	1.9	5.1
Puffballs (fungi)	"	0.5	0.5	1	10	0.6	2.6

Table III B-9

REVEGETATION PLOT DATA
JUNE 1977

STAND # trench

SPECIES/CATEGORY	SIZE OF QUADRAT	Σ COVER	$\bar{X}$ COVER(%)	# OF PLOTS OF OCCURRENCE	FREQUENCY(%)	RELATIVE COVER	RELATIVE FREQUENCY
Agropyron desertorum	$1m^2$	2.0	2.0	1	10	1.3	2.2
Agropyron intermedium	"	34.5	34.5	7	70	21.8	15.2
Agropyron smithii	"	52.0	52.0	10	100	32.9	21.7
Agropyron trichophorum	"	7.0	7.0	2	20	4.4	4.4
Artemisia tridentata	"	4.0	4.0	1	10	2.5	2.2
Astragalus sp.	"	2.5	2.5	4	40	1.6	8.7
Bromus sp.	"	1.0	1.0	1	10	0.6	2.2
Bromus tectorum	"	3.0	3.0	1	10	1.9	2.2
Chrysothamnus viscidiflorus	"	1.0	1.0	1	10	0.6	2.2
Comandra sp.	"	1.0	1.0	2	20	0.6	4.4
Crepis acuminatus	"	0.5	0.5	1	10	0.3	2.2
Koeleria cristata	"	9.0	9.0	3	30	5.7	6.5
Lithospermum sp.	"	0.5	0.5	1	10	0.3	2.2
Oryzopsis hymenoida	"	1.5	1.5	2	20	1.0	4.4
Perennial Grass	"	30.5	30.5	3	30	19.3	6.5
Phlox longifolia	"	0.5	0.5	1	10	0.3	2.2
Poa sp.	"	6.0	6.0	2	20	3.8	4.4
Purshia tridentata	"	0.5	0.5	1	10	0.3	2.2
Senecio sp.	"	0.5	0.5	1	10	0.3	2.2
Stipa comata	"	0.5	0.5	1	10	0.3	2.2

TABLE III B-10

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-1
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	0	0	1	15	1	1	2	0	5	5	10	2	2	2	2	20	0	5	0	18	3	5	15	0	0
	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Annual Forbs	180	90	200	100	60	50	40	100	120	120	120	110	600	80	300	280	50	80	210	90	70	320	15	115	380
	450	200	60	140	60	170	130	70	150	100	80	60	200	230	130	300	120	310	50	40	400	200	450	5000	400
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	180	90	201	115	61	51	42	100	125	125	130	112	602	82	302	300	50	85	210	108	73	325	30	115	380
	485	200	60	140	60	170	130	70	150	100	80	60	200	230	130	300	120	310	50	40	400	200	500	5000	400

TABLE III B-11

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-10
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	30	4	10	0	90	40	0	60	30	30	35	40	60	20	30	50	0	0	0	60	50	80	0	80	85
	50	0	100	90	0	100	120	0	40	50	110	40	50	40	60	90	70	100	80	40	70	80	110	80	80
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
Perennial Forbs	0	0	0	0	0	8	9	0	15	0	0	0	0	5	7	0	0	0	0	0	0	0	0	10	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	3	0	20	0	0	0
Annual Forbs	380	400	400	300	40	120	300	330	90	300	350	300	100	90	80	80	500	700	500	400	250	70	8000	170	300
	300	10000	9000	40	2000	120	220	2000	500	10000	150	180	220	230	350	110	450	250	130	300	400	10	40	5	200
Half Shrubs	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	410	404	410	300	130	168	359	390	135	330	385	340	160	115	117	130	500	700	500	460	300	150	8000	260	385
	350	10000	9100	130	2000	220	340	2000	540	10050	260	220	270	270	410	200	528	350	210	343	470	120	150	85	280

TABLE III B-12

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-15
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	35	50	55	70	80	80	100	40	80	70	40	80	55	80	85	20	55	50	85	70	60	45	65	55	55
	45	70	110	40	65	65	40	90	50	70	50	55	90	60	90	100	50	20	70	75	55	45	60	40	55
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	0	10	0	6	7	0	5	1	6	2	0	0	0	6	0	0	0	9	40	<1	0	0	0	0	2
	0	0	14	0	20	<1	0	0	4	0	4	0	0	0	0	0	0	0	30	2	0	0	0	2	4
Annual Forbs	0	<1	0	0	0	30	0	0	0	0	0	0	0	0	0	0	6	6	12	0	0	0	10	0	0
	1	11	0	0	0	0	0	0	0	0	0	0	8	0	0	20	55	0	15	0	0	0	0	0	15
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	3	0	0	0
Totals	35	61	55	76	87	110	105	41	86	72	40	80	55	86	85	20	61	65	137	71	60	45	75	55	57
	46	81	224	40	85	66	40	90	54	70	54	55	98	60	90	132	105	20	115	77	55	48	60	42	74

TABLE III B-13

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-16
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	25	10	40	10	30	0	40	30	35	25	25	15	50	10	85	15	0	80	15	40	30	15	85	5	40
	1	35	10	10	65	80	35	79	15	20	25	11	100	17	20	80	5	20	10	80	20	50	7	25	8
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<1	0	0	0
Perennial Forbs	0	0	1	10	0	0	0	10	5	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
	0	0	0	0	0	30	0	2	0	0	0	25	0	0	2	0	0	0	0	0	5	0	0	0	0
Annual Forbs	50	40	80	170	20	200	10	20	20	20	210	200	20	210	2	200	300	15	180	320	65	180	40	190	125
	220	50	190	210	20	100	160	2	190	50	50	80	100	60	200	30	200	180	210	130	180	82	200	200	100
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	75	50	121	190	50	200	50	60	60	70	235	215	70	220	87	215	300	95	195	360	95	195	125	195	178
	221	85	200	220	85	210	195	83	105	70	75	116	200	77	222	110	205	200	220	210	205	133	207	225	108

TABLE III B-14

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-17
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	60	25	125	180	110	50	120	100	200	220	190	110	110	40	55	120	140	110	130	60	90	70	30	27	55
	160	60	75	45	100	160	300	150	80	170	200	300	100	110	230	130	70	90	120	80	80	200	120	260	200
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	0	0	0	0	0	0	2	1	0	0	0	<1	0	20	0	0	0	0	0	0	0	0	2	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	2	0
Annual Forbs	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	10	2	0	1
	0	20	0	0	0	0	0	20	0	2	0	0	0	3	7	0	35	0	0	<1	<1	0	0	0	0
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	64	25	125	180	110	50	122	101	200	220	190	111	110	62	55	120	148	110	130	60	90	80	34	27	57
	60	80	75	45	100	160	300	170	80	172	200	300	100	113	257	130	140	90	120	81	81	200	120	262	200

TABLE III B-15

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-18
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	30	15	6	80	80	70	15	10	40	110	0	0	3	1	50	40	30	35	15	40	50	35	35	2	20
	0	0	20	12	0	8	0	3	10	25	0	0	5	8	15	15	0	40	15	10	12	10	100	0	100
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	8	0	15	0	0	0	0	0	0	8	0	5	0	5	5	0	0	0	0	0	20	30	0
Annual Forbs	50	125	350	110	150	200	200	140	110	25	400	450	10	250	20	250	200	150	200	200	120	220	100	250	115
	300	190	90	115	125	200	300	280	200	400	350	600	300	400	100	200	250	100	250	150	300	300	80	120	30
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Totals	86	140	356	190	230	270	215	150	150	135	400	450	13	251	70	290	230	185	215	240	170	255	135	252	135
	300	190	118	127	140	228	300	283	210	425	350	608	305	413	116	220	255	140	265	160	312	310	200	150	138

TABLE III B-16

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number SG-19
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	0	0	80	5	25	8	7	1	5	50	55	20	8	0	0	50	180	60	1	120	150	300	1	0	500
	160	0	300	0	250	100	110	0	60	150	10	45	15	7	20	0	35	5	0	0	20	6	3	30	6
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	6	0	0	40	10	0	0	1	0	120	0	3	0	0	0	0	0	12	20	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	2	3	1	0	0	0	0	0	3	0	0	0	10	12	2	0	0
Annual Forbs	130	320	100	30	70	230	190	50	300	110	120	40	350	380	500	180	300	100	230	700	2000	10000	120	10000	0
	1100	500	500	2500	500	600	150	100	20	50	250	350	300	280	80	350	150	350	350	300	230	30	130	110	130
Half Shrubs	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	10	0	0	0	0	0
Totals	136	320	180	75	109	238	187	52	305	280	175	63	358	380	500	230	480	172	251	820	2150	10300	121	10000	500
	1260	500	800	2500	750	700	260	100	82	203	260	395	315	287	130	350	188	355	350	310	260	48	135	140	136

TABLE III B-17

FRESH WEIGHT ESTIMATES (GRAMS) FOR PEAK SEASON CLIPPING, 1977
DATA FROM THE EIGHT SELECTED DISTURBED DRILL PADS

Plot Number NQ-12
Clipping Period September

Quadrat Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Perennial Grasses	20	40	55	40	60	35	50	35	25	50	3	25	45	45	65	35	20	100	50	50	50	50	150	40	75
	45	65	45	50	65	55	100	60	60	50	50	20	60	70	40	60	30	35	30	0	15	40	6	90	50
Annual Grasses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perennial Forbs	15	7	30	0	1	40	6	5	1	<1	3	10	40	40	0	0	0	0	30	0	1	1	0	0	6
	30	20	0	0	10	0	8	15	0	0	0	0	0	6	0	0	30	0	0	0	7	0	0	0	0
Annual Forbs	2	0	20	0	40	180	0	1	35	100	60	8	50	70	40	110	140	70	250	30	0	60	10	10	0
	10	280	60	160	100	0	0	40	0	<1	0	500	50	110	10	110	20	0	35	0	6	170	2	2	300
Half Shrubs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	20
Totals	37	47	105	40	101	255	56	41	61	151	66	43	135	155	105	145	160	170	330	80	51	111	160	50	81
	85	368	105	210	175	55	108	115	60	51	50	520	110	186	50	174	80	35	65	0	28	210	8	92	370

TABLE III B-18

OVEN DRY WEIGHTS (GRAMS), PEAK SEASON CLIPPING, 1977 FOR THE EIGHT SELECTED DISTURBED DRILL PADS

a. Plot - SG-1 Quadrat Number	Annual Forbs	Annual Grasses	Perennial Forbs	Perennial Grasses	Total Weight
3	269.13			0.13	269.26
8	93.85				93.85
9	85.97			0.72	86.69
13	222.40			0.03	222.43
14	65.81			0.31	66.12

b. Plot - SG-10 Quadrat Number	Annual Forbs	Annual Grasses	Perennial Forbs	Perennial Grasses	Total Weight
2	382.00			1.18	383.18
8	245.63			37.45	283.08
11	281.95			9.94	291.89
13	54.26			22.16	76.42
38	157.28			21.87	179.15

c. Plot - SG-15 Quadrat Number	Annual Forbs	Annual Grasses	Perennial Forbs	Perennial Grasses	Total Weight
2	0.02		4.87	36.28	41.17
8			0.18	27.15	27.33
11				35.68	35.68
13				52.47	52.47
38			2.34	75.97	78.31

d. Plot - SG-16 Quadrat Number	Annual Forbs	Annual Grasses	Perennial Forbs	Perennial Grasses	Total Weight
2	115.22			11.30	126.52
21	59.17			16.08	75.25
33	0.72		0.61	35.30	36.63
47	55.26	0.04			55.30
49	125.47			9.62	135.09

TABLE III B-19

OVEN DRY WEIGHTS (GRAMS), PEAK SEASON CLIPPING, 1977 FOR THE EIGHT SELECTED DISTURBED DRILL PADS

a. Plot - SG-17 Quadrat Number	Annual Forbs	Annual Grasses	Perennial Forbs	Perennial Grasses	Total Weight
5	0.08			87.45	87.53
6				60.76	60.76
8	0.01		0.34	104.25	104.60
17	6.28		0.06	80.84	87.78
24	0.01			26.72	26.73
b. Plot - SG-18 Quadrat Number					
3	166.15			2.91	169.06
5	78.33			34.62	112.45
8	75.22			3.94	79.16
35	182.59			11.39	193.98
41	133.93		1.52	9.21	144.66
c. Plot - SG-19 Quadrat Number					
3	66.19		0.25	25.67	41.86
8	70.41			0.78	71.44
9	127.63			1.31	128.94
13	123.42			2.79	126.21
14	122.87				122.87
d. Plot - NQ-12 Quadrat Number					
3	5.91		16.44	17.41	39.76
5	12.27		1.02	26.23	39.52
8	0.74		1.52	19.33	21.59
35	0.63			31.08	31.71
41	57.62			25.19	82.81

MICRO-ENVIRONMENTAL
STUDIES

III C Microenvironmental Program

Introduction

Microenvironmental studies conducted during the Interim Monitoring Period include the following:

1. Continuous recording measurements made at 4 stations in each of the major vegetation types.
2. Spot check data collected at 17 sites, including the 4 recording stations.
3. Evaporation data collected at one station.
4. Soil and plant water potential data collected at sites corresponding to the 17 spot check locations.

Scope of Study

The scope of the micrenvironmental program has been detailed in previous data reports.

Methods

Methods employed in these studies are the same as those used during the baseline program for the continuous recording and spot check stations. Evaporation and soil/plant water potential data collections were inititated during the Interim Monitoring Period.

Evaporation data is obtained from a class C evaporation station (U. S. Weather Bureau type) at least twice weekly. The measurements include water level change (m) total wind (km), precipitation (cm), minimum surface water temperature (^{o}C), and maximum surface water temperature (^{o}C).

Soil and plant moisture potentials were measured using thermocouple psychrometry. Soil moisture potential measurements were taken monthly from duplicate soil psychrometers located at a depth of 30 cm. Leaf moisture potential measurements were taken monthly from selected species at each of the 17 sites described above.

Results and Discussion

Results of data collections in the Microenvironmental program were shown below. No detailed analysis of these data are currently available.

MICROENVIRONMENTAL DATA, TABLE III C-1

MEAN, MEAN MAXIMUM AND MEAN MINIMUM - AMBIENT AIR TEMPERATURES

	1976		1977							
Mean Min$^{\circ}$C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	5.0	*	-6.8	-5.3	-7.1	3.6	8.6	9.2	10.8	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	-5.3	*	-11.8	-8.3	-9.8	-0.7	0.4	*	*	*
ME4 - BOTTOMLAND SAGEBRUSH	-34.3	-37.7	-39.0	-37.8	-32.6	3.6	9.5	6.7	*	
ME3 - UPLAND SAGEBRUSH	-2.9	-10.5	-12.0	-8.5	-9.0	-6.6	*	9.4	10.9	

Mean Mean$^{\circ}$C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	12.2	*	0.7	1.0	-1.4	4.0	9.2	19.8	19.4	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	2.3	*	-4.6	-0.3	-1.8	8.3	9.3	*	*	*
ME4 - BOTTOMLAND SAGEBRUSH	-24.5	-30.0	-32.8	-26.6	-22.4	3.9	9.9	19.5	*	
ME3 - UPLAND SAGEBRUSH	3.2	-5.0	-6.8	-3.0	-2.5	-6.4	*	18.1	13.3	

Mean Max$^{\circ}$C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	17.1	*	7.5	9.3	4.6	4.4	9.6	30.4	28.1	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	12.1	*	4.4	9.9	5.6	17.7	17.9	*	*	*
ME4 BOTTOMLAND SAGEBRUSH	-7.6	-19.5	-23.1	-9.1	-9.3	4.2	10.1	32.0	*	
ME3 - UPLAND SAGEBRUSH	10.6	1.4	0.7	3.6	3.3	-6.4	*	26.5	25.9	

*missing data

MICROENVIRONMENTAL DATA, TABLE III C-2

MEAN, MEAN MAXIMUM AND MEAN MINIMUM - SURFACE TEMPERATURES

	1976		1977							
Mean Min°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	2.4	*	-4.76	-7.5	-4.4	5.5	10.8	9.7	11.1	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	-11.2	*	-11.1	-12.9	-6.5	-3.5	-2.9		*	
ME4 - BOTTOMLAND SAGEBRUSH	-17.2	-22.1	-18.6	-20.7	-12.0	4.3	10.8	8.6	*	
ME3 - UPLAND SAGEBRUSH	-10.1	-16.3	- 9.6	-9.2	-3.3	9.5	*	6.8	8.8	

Mean Mean°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	14.2	*	-1.0	1.1	1.2	5.9	11.4	24.9	22.2	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	1.4	*	-4.8	0.2	0.3	11.1	13.1		*	
ME4 - BOTTOMLAND SAGEBRUSH	0.8	-15.0	-14.6	-13.1	-8.0	4.6	11.2	23.7	*	
ME3 - UPLAND SAGEBRUSH	2.0	-7.8	-6.9	-4.6	-2.0	9.5	*	24.5	22.3	

Mean Max°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND	31.6	*	4.8	16.2	14.6	6.5	12.1	49.6	40.1	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	21.9	*	3.4	21.4	11.2	35.0	37.1		*	
ME4 BOTTOMLAND SAGEBRUSH	8.9	-3.5	-9.2	-0.2	-2.2	5.0	11.5	46.7	*	
ME3 - UPLAND SAGEBRUSH	26.0	8.8	-3.6	2.2	0.3	9.5	*	48.0	42.3	

*missing data

MICROENVIRONMEN DATA, Table III C-3

MEAN, MEAN MAXIMUM AND MEAN MINIMUM -20 cm SOIL TEMPERATURES

	Mean Min°C	1976		1977							
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	0.8	0.9	1.4	5.5	9.8	17.2	19.1	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	-3.3	-1.1	-0.2	5.6	9.0		*	
ME4 -	BOTTOMLAND SAGEBRUSH		-5.7	-6.0	-5.7	-2.1	5.0	11.3	19.2	*	
ME3 -	UPLAND SAGEBRUSH		-18.6	-27.7	-22.1	-16.3	-12.9	*	*	18.0	

	Mean Mean°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	1.2	1.5	1.9	6.6	10.8	18.2	20.6	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	-2.4	0.0	0.8	7.9	10.8		*	
ME4 -	BOTTOMLAND SAGEBRUSH		-5.4	-5.5	-5.3	-1.8	5.3	12.1	19.9	*	
ME3 -	UPLAND SAGEBRUSH		-17.0	-25.9	-20.7	-14.5	-12.3	*	*	19.0	

	Mean Max°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	1.6	2.0	2.6	8.1	12.0	19.2	23.8	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	-1.5	1.1	1.9	14.3	12.8		*	
ME4	BOTTOMLAND SAGEBRUSH		-5.1	-5.0	-4.9	-1.6	6.1	13.1	20.6	*	
ME3 -	UPLAND SAGEBRUSH		-15.4	-24.3	-19.3	-13.3	-12.1	*	*	20.5	

*missing data

MICROENVIRONMENTAL DATA, Table III C-4

MEAN, MEAN MAXIMUM AND MEAN MINIMUM -40cm SOIL TEMPERATURES

	1976		1977							
Mean Min°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND		*	1.9	1.8	1.4	5.4	0.0	16.9	19.4	
ME7 - CHAINED PINYON-JUNIPER RANGELAND		*	-1.6	-0.4	0.5	5.4	8.6	*	*	*
ME4 - BOTTOMLAND SAGEBRUSH		-3.4	-4.6	-4.6	2.1	5.0	3.0	17.4	*	
ME3 - UPLAND SAGEBRUSH		-12.1	-7.6	4.8	-16.3	-12.9	0.3	*	17.4	

Mean Mean°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND		*	2.1	2.0	1.9	6.6	13.5	17.3	20.6	
ME7 - CHAINED PINYON-JUNIPER RANGELAND		*	-0.9	0.4	1.4	6.6	9.6	*	*	*
ME4 - BOTTOMLAND SAGEBRUSH		-3.1	-4.0	-4.1	-1.8	5.3	14.1	18.0	*	
ME3 - UPLAND SAGEBRUSH		-11.5	-6.8	-5.4	-14.5	-12.3	14.5	*	18.0	

Mean Max°C	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 - PINYON-JUNIPER WOODLAND		*	2.4	2.4	2.6	8.1	38.6	17.5	21.8	
ME7 - CHAINED PINYON-JUNIPER RANGELAND		*	-0.2	1.3	2.2	7.2	10.4	*	*	*
ME4 BOTTOMLAND SAGEBRUSH		-2.9	-3.6	-3.6	-1.6	6.1	35.1	18.4	*	
ME3 - UPLAND SAGEBRUSH		-10.9	-6.0	6.1	-13.3	-12.1	35.2	*	18.6	

*missing data

MICROENVIRONMENTAL DATA, Table III C-5

MEAN, MEAN MAXIMUM AND MEAN MINIMUM -60cm SOIL TEMPERATURES

Mean Min°C

			1976	1977							
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	3.1	2.5	1.3	0.0	1.8	13.9	17.2	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	-0.6	-11.6	-20.0	-18.6	-31.8		*	
ME4 -	BOTTOMLAND SAGEBRUSH		-1.3	-3.0	-3.4	-1.2	-3.0	-0.3	15.2	*	
ME3 -	UPLAND SAGEBRUSH		-11.0	-11.6	-11.3	-9.7	-1.1	3.5	*	15.7	

Mean Mean°C

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	3.2	2.9	1.6	7.0	9.9	14.3	18.0	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	0.1	0.3	-0.3	4.2	-10.4		*	
ME4 -	BOTTOMLAND SAGEBRUSH		-1.0	-2.5	-2.8	-0.9	7.2	10.2	15.9	*	
ME3 -	UPLAND SAGEBRUSH		-10.4	-10.9	-10.7	-9.2	5.0	11.1	*	16.5	

Mean Max°C

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
ME6 -	PINYON-JUNIPER WOODLAND		*	3.5	3.2	1.8	15.7	18.6	14.7	18.6	
ME7 -	CHAINED PINYON-JUNIPER RANGELAND		*	0.5	1.4	2.2	6.3	9.3		*	
ME4	BOTTOMLAND SAGEBRUSH		-0.8	-2.3	-2.3	-0.6	17.9	20.1	16.6	*	
ME3 -	UPLAND SAGEBRUSH		-9.7	-10.4	-10.2	-8.5	11.8	17.5	*	17.1	

*missing data

MICROENVIRONMENTAL DATA, Table III C-6

TOTAL PRECIPITATION (mm)

	1976		1977							
	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG
ME6 - PINYON-JUNIPER WOODLAND	10.7	*	1.2	0.0	0.3	0.9	0.8	0.0	87.8	
ME7 - CHAINED PINYON-JUNIPER RANGELAND	8.6	*	0.0	0.0	0.0	3.8	2.5		*	
ME4 - BOTTOMLAND SAGEBRUSH	0.0	0.0	0.4	0.3	0.6	1.3	1.0	.03		
ME3 - UPLAND SAGEBRUSH	1.1	0.0	0.5	0.3	0.4	1.5	0.3	0.2	178.1	

*missing data

MICROENVIRONMENTAL SPOT CHECK DATA* TABLE III C-7

Plot	DECEMBER 1976			JANUARY 1977			FEBRUARY 1977			MARCH 1977			APRIL 1977			MAY 1977			JUNE 1977			AUGUST 1977		
	Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C		Precip. cm.	Temperature °C	
		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.		Min.	Max.
1-M1	0.00	-27	17	0.30	-29	11	1.47	-19	19	2.41	-17	19	5.12	-17	29	1.86	-8	32	0.25	0	40	2.62	3	37
2-M2	0.20	-30	17	1.52	-32	20	1.98	-22	18	1.17	-20	17	4.60	-18	30	2.03	-9	33	0.51	-2	41	1.54	1	40
3-M3	0.23	-30	6	1.47	-32	10	2.26	-22	8	1.63	-20	13	4.35	-17	20	1.27	-8	30	0.08	-1	38	9.75	2	36
4-M4	0.51	-32	19	0.73	-21	13	2.01	-25	21	1.42	-20	21	4.65	-18	32	1.65	-10	36	0.38	-2	41	2.46	1	40
5-M5	0.25	-25	14	0.61	-27	11	( )	-20	10	1.14	-16	15	2.85	-18	29	0.71	-9	31	0.15	-2	( )	4.06	( )	( )
6-M6	0.64	-15	11	0.75	-6	12	1.98	-20	15	1.65	-11	16	4.29	-16	28	1.73	-5	32	0.18	0	42	3.18	5	36
7-M7	0.00	-29	24	1.47	-17	14	1.73	-22	21	1.07	-19	20	4.24	-17	28	2.01	-7	30	0.20	0	39	5.79	4	38
20-M8	( )	( )	( )	0.81	-28	24	( )	-20	29	0.02	-16	22	0.38	-15	32	1.35	-8	37	( )	( )	( )	4.57	6	44
0-M9	0.25	-26	22	2.08	-32	20	1.78	-19	24	1.25	-19	20	3.49	-15	31	1.22	-8	38	0.48	-1	43	4.65	3	39
0-M10	0.51	-31	20	1.33	-34	15	2.34	-25	21	1.65	-20	26	4.50	-16	31	2.09	-10	35	0.23	-2	44	5.61	2	32
0-M11	0.20	-26	9	1.83	-29	13	2.31	-22	20	1.37	-18	17	4.40	-17	28	1.78	-7	30	0.18	4	38	2.74	5	35
19-M12	0.38	-32	20	1.78	-30	15	2.01	-23	22	1.55	-21	21	4.79	-16	31	1.73	-10	34	0.15	0	41	2.72	1	37
0-M13	0.76	-22	4	1.24	-28	11	( )	-22	16	0.00	-17	20	2.24	-17	27	1.96	-15	30	0.20	0	38	3.43	3	33
0-M14	0.33	-26	14	1.17	-28	14	1.30	-20	18	0.91	-17	20	2.87	-16	25	1.68	-6	31	0.13	1	40	3.30	4	35
0-M15	0.38	-28	40	1.22	-30	12	1.60	-26	18	1.35	-18	20	3.79	-15	29	1.50	-7	33	0.43	0	42	4.06	5	33
15-M16	0.81	-33	16	1.87	-33	11	0.76	-22	17	( )	-23	15	2.82	-20	24	1.58	-8	30	0.38	-2	39	1.78	2	34
22-M17	0.33	-31	23	1.40	-31	11	1.85	-29	17	0.91	-21	15	4.16	-17	27	1.86	-9	31	0.20	-1	39	2.29	1	31

( ) = Missing data

* = July data is missing

Table III C-8

EVAPORATION DATA FOR TRACT C-b, 1977

MONTH	DAYS	NUMBER OF OBSERVATIONS	TOTAL WIND	MEAN DAILY WIND	MINIMUM TEMPERATURE	MAXIMUM TEMPERATURE	WATER CHANGE	TOTAL PRECIPITATION	TOTAL EVAPORATION	MEAN DAILY EVAPORATION RATE
APRIL	12-18	6	682 Km	113.66	---	---	0.88 cm	2.23 cm	3.11 cm	0.52 cm
	18-22	4	495 Km	123.75	---	---	1.50 cm	0.25 cm	1.75 cm	0.44 cm
***	22-26									0.53 cm
MAY	26-03	7	1180 Km	168.57	5.0 C	22.0 C	4.21 cm	0.03 cm	4.24 cm	0.61 cm
***	03-10									0.65 cm
	10-13	3	527 Km	175.66	0.0 C	18.0 C	2.08 cm	0.00 cm	2.08 cm	0.69 cm
***	13-17									0.66 cm
	17-24	7	1108 Km	158.28	0.0 C	21.0 C	4.40 cm	0.03 cm	4.43 cm	0.63 cm
	24-29	5	827 Km	165.40	5.0 C	17.0 C	1.58 cm	0.51 cm	2.09 cm	0.42 cm
JUNE	29-06	8	1126 Km	140.75	2.0 C	25.0 C	6.14 cm	0.00 cm	6.14 cm	0.77 cm
	06-13	7	1022 Km	146.00	8.0 C	25.0 C	5.10 cm	0.05 cm	5.15 cm	0.74 cm
	13-21	8	1321 Km	165.12	7.0 C	27.0 C	8.34 cm	0.00 cm	8.34 cm	1.04 cm
	22-24	2	217 Km	108.50	9.0 C	28.0 C	1.76 cm	0.00 cm	1.76 cm	0.88 cm

PRESSURE AVERAGE 794 Mbs

*** MISSING DATA

Table III C-8 (continued)
EVAPORATION DATA FOR TRACT C-b, 1977

MONTH	DAYS	NUMBER OF OBSERVATIONS	TOTAL WIND	MEAN DAILY WIND	MINIMUM TEMPERATURE	MAXIMUM TEMPERATURE	WATER CHANGE	TOTAL PRECIPITATION	TOTAL EVAPORATION	MEAN DAILY EVAPORATION RATE
JULY	24-1	8	889 Km	127.00	10.0 C	28.0 C	6.71 cm	0.00 cm	6.71 cm	0.84 cm
	1-8	7	1003 Km	143.29	10.0 C	26.0 C	5.23 cm	0.05 cm	5.28 cm	0.75 cm
	8-15	7	1191 Km	170.14	10.0 C	28.0 C	6.87 cm	0.00 cm	6.87 cm	0.98 cm
	15-22	7	787 Km	112.43	12.0 C	28.0 C	1.37 cm	2.97 cm	4.34 cm	0.62 cm
	22-29	7	701 Km	100.14	11.0 C	28.0 C	2.52 cm	0.97 cm	3.49 cm	0.50 cm
AUGUST	29-5	7	736 Km	105.14	11.0 C	28.0 C	4.83 cm	0.10 cm	4.93 cm	0.70 cm
	5-12	7	749 Km	107.00	11.0 C	27.0 C	4.55 cm	0.89 cm	5.44 cm	0.78 cm
	12-19	7	644 Km	92.00	9.0 C	26.0 C	2.36 cm	0.79 cm	3.15 cm	0.45 cm
	19-26	7	849 Km	121.29	12.0 C	28.0 C	3.11 cm	0.94 cm	4.05 cm	0.58 cm
SEPTEMBER	26-2	7	973 Km	139.00	7.0 C	25.0 C	2.24 cm	2.46 cm	4.71 cm	0.67 cm

Table III C-9

SOIL-WATER POTENTIAL DATA

June, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	BARS
Chained Pinyon-Juniper Rangeland	1-1M	6/8	1	25.1
			18	21.2
	2-2M	6/9	2	24.0
			19	9.4
	7-7M	6/10	7	31.4
			24	31.6
Pinyon-Juniper Woodland	5-5M	6/1	5	23.5
			22	29.4
	6-6M	6/2	6	27.9
			23	16.8
	0-14M	6/8	14	19.6
			31	22.3
	0-15M	6/10	15	6.7
			32	5.9
Bottomland Sagebrush Community	4-4M	6/9	4	24.0
			21	22.7
	0-9M	6/8	9	20.2
			26	25.1
	0-12M	6/8	12	27.7
			29	19.8
Upland Sagebrush Community	3-3M	6/8	3	31.2
			20	23.7
	0-16M	6/10	16	19.4
			33	13.3
Bunchgrass Community	20-8M	6/8	8	19.0
			25	25.7
	0-11M	6/8	11	11.9
			28	11.0
Rabitbrush Community	0-10M	6/8	10	20.2
			27	17.2
Mixed Mountain Shrubland	0-13M	6/8	13	2.9
			30	15.5
Annual Weed Community	0-17M	6/9	17	26.4
			34	34.2

Table III C-10

SOIL-WATER POTENTIAL DATA

July, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	BARS
Chained Pinyon-Juniper Rangeland	1-1M	6/23	1	45.8*
			18	37.6*
	2-2M	7/20	2	44.8
			19	30.7
	7-7M	7/22	7	46.2
			24	50.3
Pinyon-Juniper Woodland	5-5M	6/24	5	37.8
			22	37.2
	6-6M	7/21	6	57.4
			23	36.0
	0-14M	7/22	14	46.9
			31	49.0
	0-15M	6/23	15	8.9
			32	9.2
Bottomland Sagebrush Community	4-4M	7/20	4	46.8
			21	48.3
	0-9M	7/21	9	31.7
			26	8.5
	0-12M	7/22	12	15.0
			29	26.9
Upland Sagebrush Community	3-3M	6/23	3	54.0*
			20	47.8*
	0-16M	6/23	16	38.4
			33	32.6
Bunchgrass Community	20-8M	6/28	8	29.8*
			25	51.7
	0-11M	7/20	11	33.1*
			28	31.7*
Rabitbrush Community	0-10M	7/21	10	32.7
			27	33.0
Mixed Mountain Shrubland	0-13M	7/20	13	32.6
			30	23.4
Annual Weed Community	0-17M	7/21	17	65.3*
			34	23.2

* Temperature gradient too steep, questionable data

Table III C-11

SOIL-WATER POTENTIAL DATA

August, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	BARS
Chained Pinyon-Juniper Rangeland	1-1M	8/25	1	36.7
			18	35.6
	2-2M	8/24	2	35.0
			19	40.2
	7-7M	8/23	7	43.7
			24	37.5
Pinyon-Juniper Woodland	5-5M	8/25	5	35.0
			22	41.7
	6-6M	8/26	6	37.4
			23	18.5
	0-14M	8/25	14	36.4
			31	30.6
	0-15M	8/23	15	13.3
			32	11.4
Bottomland Sagebrush Community	4-4M	8/24	4	28.8
			21	25.7
	0-9M	8/23	9	18.0
			26	19.4
	0-12M	8/26	12	15.3
			29	15.6
Upland Sagebrush Community	3-3M	8/26	3	18.2
			20	26.9
	0-16M	8/23	16	27.3
			33	26.2
Bunchgrass Community	20-8M	8/24	8	16.6
			25	63.3
	0-11M	*	11	*
			28	*
Rabitbrush Community	0-10M	8/26	10	18.2
			27	15.7
Mixed Mountain Shrubland	0-13M	8/26	13	25.8
			30	20.4
Annual Weed Community	0-17M	8/24	17	50.0
			34	61.0

* Missing data

Table III C-12

PLANT-SOIL WATER POTENTIAL DATA

July, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	SOIL-WATER POTENTIAL BARS	LEAF-WATER POTENTIAL BARS
Chained Pinyon-Juniper Rangeland	1-1M	6/23	1	45.8	11.3
			18	37.6	12.7
	2-2M	7/20	2	44.8	24.7
			19	30.7	50.6
	7-7M	7/22	7	46.2	9.9
			24	50.3	10.9
Pinyon-Juniper Woodland	5-5M	6/24	5	37.8	41.1
			22	37.2	17.7
	6-6M	7/21	6	57.4	13.1
			23	36.0	17.9
	0-14M	7/22	14	46.9	8.3
			31	49.0	0.0
	0-15M	6/23	15	8.9	25.6
			32	9.2	13.1
Bottomland Sagebrush Community	4-4M	7/20	4	46.8	21.6
			21	48.3	72.9
	0-9M	7/21	9	31.1	11.5
			26	8.5	17.0
	0-12M	7/22	12	15.0	11.8
			29	26.9	57.4
Upland Sagebrush Community	3-3M	6/23	3	54.0	13.9
			20	47.8	11.8
	0-16M	6/23	16	38.4	11.6
			33	32.6	59.9
Bunchgrass Community	20-8M	6/28	8	29.8	113.5
			25	51.7	92.4
	0-11M	7/20	11	33.1	19.4
			28	31.7	10.8
Rabitbrush Community	0-10M	7/21	10	32.7	9.8
			27	33.0	14.2
Mixed Mountain Shrubland	0-13M	7/20	13	32.6	27.0
			30	23.4	0.0
Annual Weed Community	0-17M	7/21	17	65.3	18.3
			34	23.2	48.4

Table III C-13

PLANT-SOIL WATER POTENTIAL DATA

August, 1977

VEGETATION TYPE	STATION	DATE	PROBE NUMBER	SOIL-WATER POTENTIAL BARS	LEAF-WATER POTENTIAL BARS
Chained Pinyon-Juniper Rangeland	1-1M	8/25	1	36.7	11.7
			18	35.6	22.6
	2-2M	8/24	2	35.0	22.5
			19	40.2	25.6
	7-7M	8/23	7	43.7	0.0
			24	37.5	41.1
Pinyon-Juniper Woodland	5-5M	8/25	5	35.0	9.6
			22	41.7	0.0
	6-6M	8/26	6	37.4	0.0
			23	18.5	31.4
	0-14M	8/25	14	36.4	28.0
			31	30.6	0.0
	0-15M	8/23	15	13.3	23.6
			32	11.4	15.4
Bottomland Sagebrush Community	4-4M	8/24	4	28.8	12.5
			21	25.7	16.0
	0-9M	8/23	9	18.0	0.0
			26	19.4	0.0
	0-12M	8/26	12	15.3	23.1
			29	15.6	17.9
Upland Sagebrush Community	3-3M	8/25	3	18.2	0.0
			20	26.9	0.0
	0-16M	8/23	16	27.3	1.1
			33	26.2	21.4
Bunchgrass Community	20-8M	8/24	8	16.6	27.8
			25	63.3	16.1
	0-11M	8/29	11	8.4	6.5
			28	6.1	*
Rabitbrush Community	0-10M	8/26	10	18.2	*
			27	15.7	34.2
Mixed Mountain Shrubland	0-13M	8/26	13	25.8	19.1
			30	20.4	22.9
Annual Weed Community	0-17M	8/24	17	50.0	31.7
			34	61.0	16.4

* Missing data